Service
Service
Service

manual

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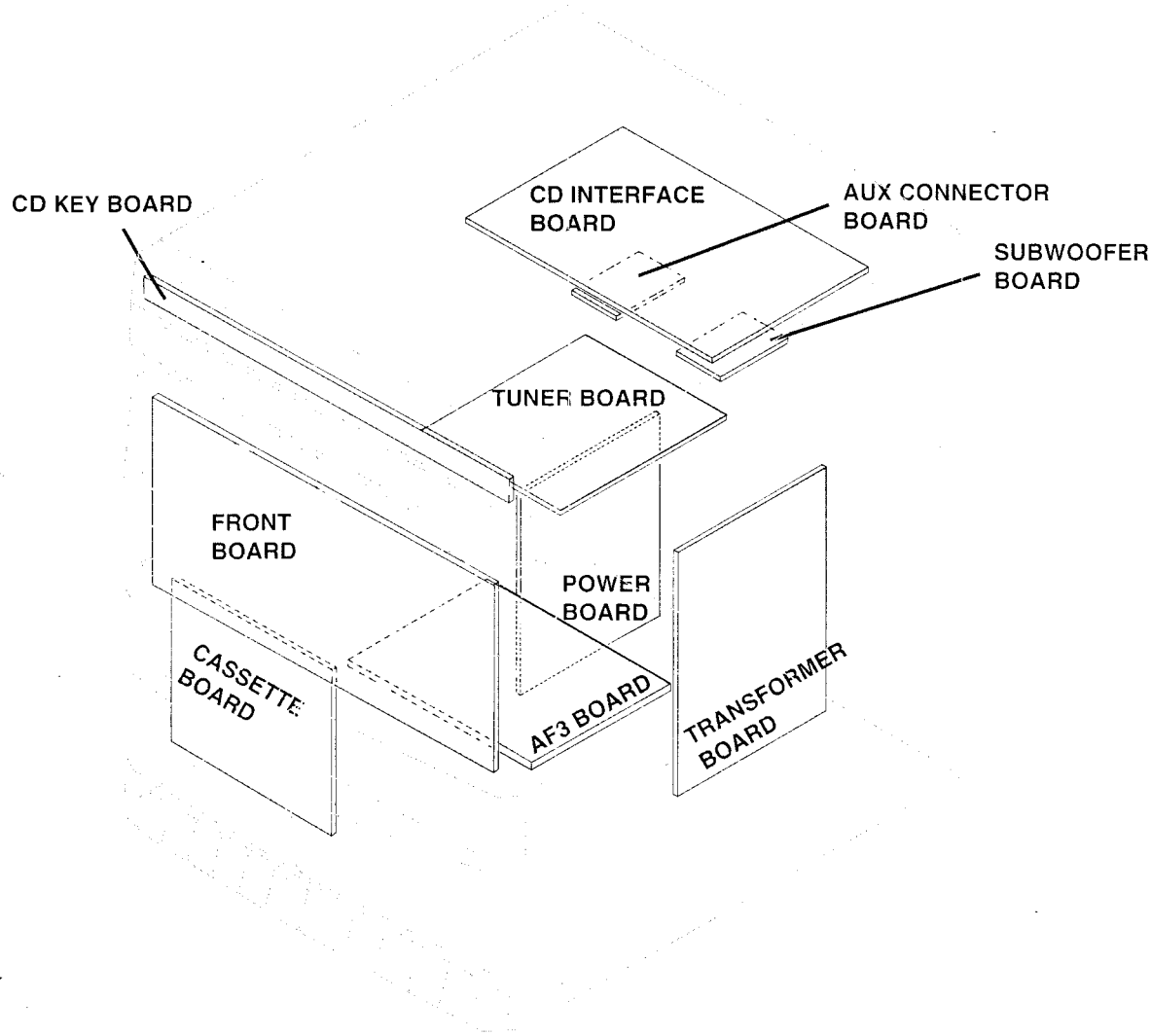
PCS 90 358

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARD



TECHNICAL SPECIFICATION

General:

Mains voltage	:	120 - 230V -/21/21M 220 - 230V -/22 250V -/25 230V -/34
Mains frequency	:	50 - 60Hz
Power consumption	:	28W max. @1/8Prated

Amplifier:

Output power	:	2 x 12W at 3Ω
Headphone	:	3.5mm stereo jack
Frequency response	:	40Hz - 20kHz (-3dB) Limit
Dynamic bass boost	:	+8dB ±1dB at 100Hz
Input sensitivity		
Aux/Line	:	400mV ±2dB
Microphone	:	2.5mV ±2dB @1kHz

Equalizer:

100 Hz	:	-1 ~ 5dB
1 kHz	:	±4dB
12kHz	:	-3 ~ 6dB

Tuner:

FM

Tuning range	:	87.5MHz - 108MHz
Grid	:	100kHz
IF	:	10.7MHz
Sensitivity Mono 26dB S/N	:	< 7µV
Distortion at RF=1mV, _f=75kHz	:	3% (1%)
IF rejection	:	> 60dB
Image rejection	:	> 25dB
-3dB Limiting Point	:	< 23.5dBf {22dBf}

MW

Tuning range	:	530kHz - 1700kHz {531 - 1602kHz}
Grid	:	10kHz
IF	:	450kHz ±1kHz
Sensitivity at 26dB S/N	:	< 4.0mV/M
Distortion at RF=50mV, m=80%)	:	< 5% {3%}
IF rejection	:	> 45dB
Image rejection	:	> 28dB

LW

Tuning Range	:	153kHz - 279kHz
Sensitivity at 26dB S/N	:	<6.0mV/M
IF rejection	:	> 26 dB
Image rejection	:	> 28dB {35dB}

CD Unit:

Frequency response within	:	20Hz - 20kHz at ±3dB
Signal/Noise ratio	:	> 86dB (A-weighted)
Channel unbalance	:	< 1dB
Channel crosstalk at 1kHz	:	> 50dB
De-emphasis	:	0 or 15/50 µS

Recorder Part:

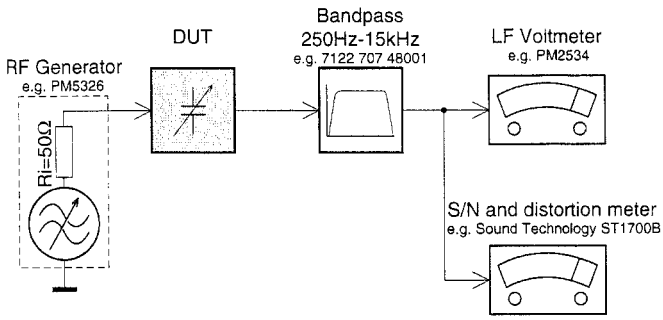
Tape speed	:	4.76 cm/sec ± 2%
Wow and flutter	:	< 0.4%
Fast-wind time C60	:	130 sec
Bias system AM/FM	:	AC 65kHz ±5kHz
Distortion at 250nWb/m	:	< 5%
Channel difference at PB	:	< 3dB
Channel difference overall	:	< 3dB
Channel Separation	:	> 24dB at 1kHz
Track Separation	:	> 55dB at 1kHz
ALC attack time	:	< 300ms
ALC recovery time	:	> 10s
Frequency Response	:	80Hz - 12.5kHz within -8dB
Signal to noise ratio ①	:	> 43dB
Signal to Hiss ratio ②	:	> 48dB
Erase attenuation ③	:	> 55dB at 1kHz

① at 250 nW/m FF-weighted (22Hz - 22kHz band pass filter)
② at 250 nW/m A-weighted
③ use a 1kHz passfilter to minimize the wide band noise component

Note : {....} for version 22 only

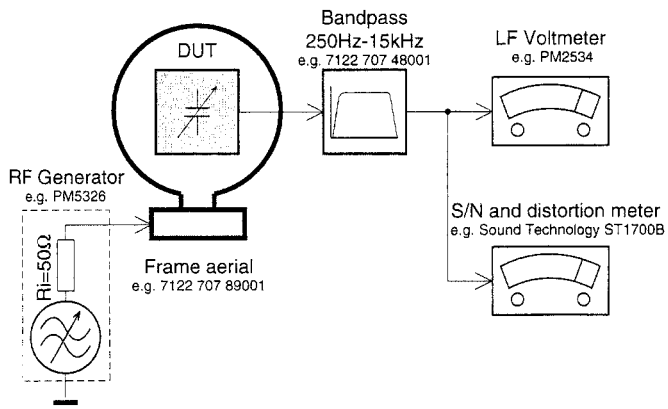
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

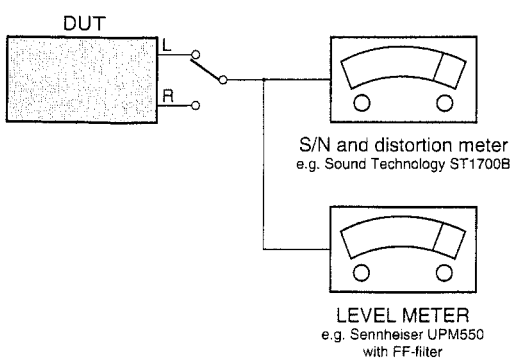
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

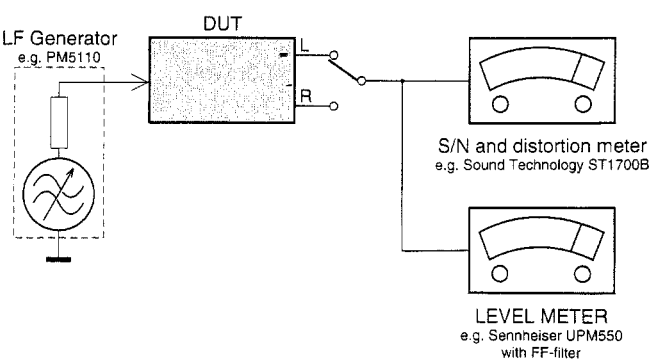
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder 4822 395 91019
Torx bit T10 150mm 4822 395 50456
Torx driver set T6 - T20 ..... 4822 395 50145
Torx driver T10 extended 4822 395 50423

Cassette:

SBC419 Test cassette CrO2 ..... 4822 397 30069
SBC420 Test cassette Fe 4822 397 30071
MTT150 Dolby level 200nWb/M 4822 397 30271

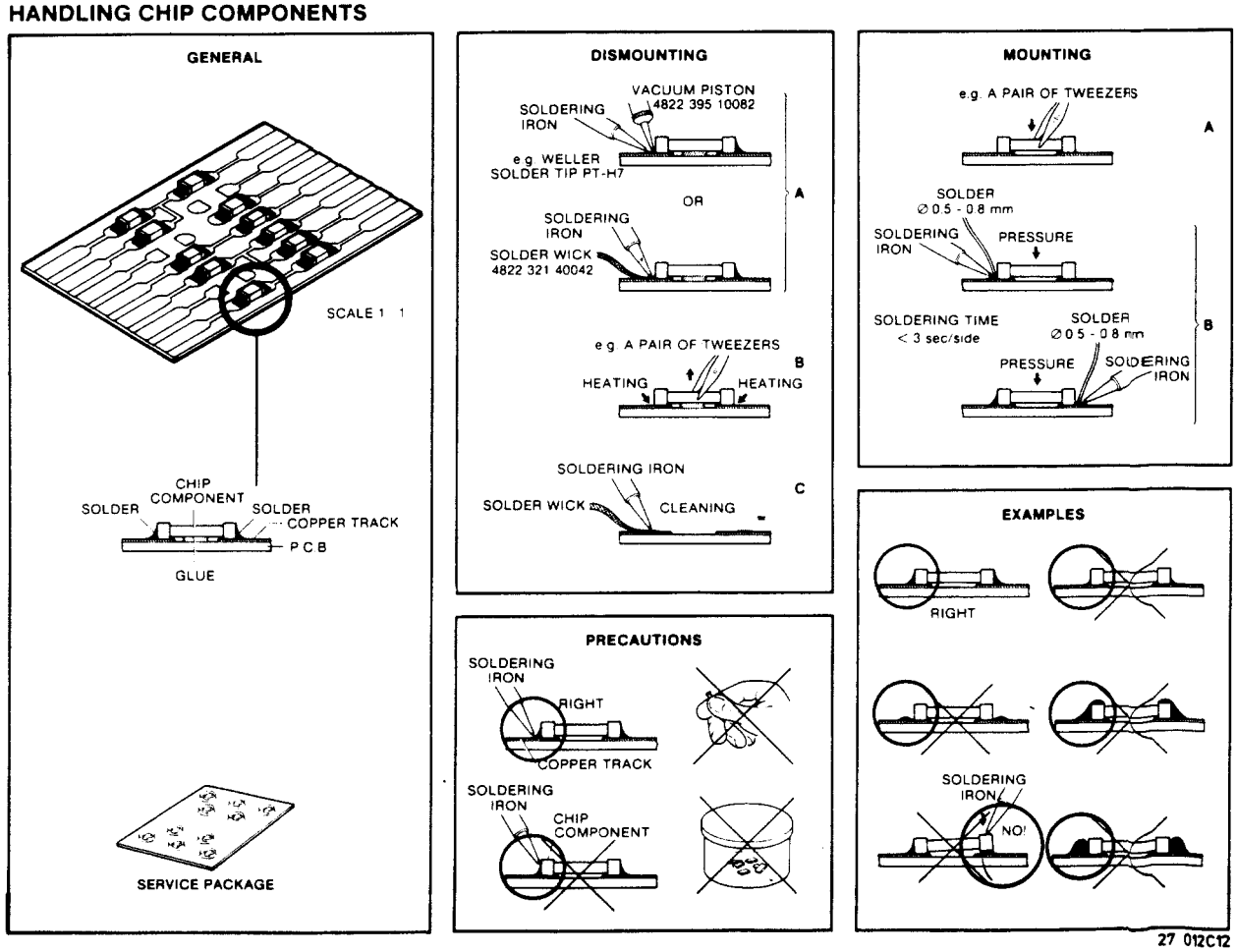
Compact Disc:

SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat to conn. box) 4822 320 11306
Earth cable (to connect product to mat or box) 4822 320 11308
Complete kit ESD3
(combining all above products) 4822 320 10671
Wristband tester 4822 344 13999

HANDLING CHIP COMPONENTS



ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les piéces de rechange identiques à celles spécifiées.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

INSTRUCTION FOR USE

English

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GENERAL INFORMATION

General Information

- The typeplate is located at the rear of the set.
- Recording is permissible if copyright or other rights of third parties are not infringed.

1 All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easy to separate into three mono-materials:
- cardboard (box)
- expandable polystyrene (buffer)
- polyethylene (bags, protective foam sheet).

Please observe the local regulations regarding the disposal of these packaging materials.

2 Your set consists of materials which can be recycled and reused if disassembled by a specialized company. Please follow local regulations on recycling your old set.

3 Do not dispose dead batteries with your household waste. Dispose batteries according to local regulations.

4 Note: Switching off the standby mode overnight (remove the AC power cord from the wall socket) will save energy.

Accessories (Supplied)

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord

SAFETY INFORMATION

Safety Information

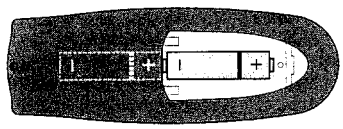
- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the unit yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the unit until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, withdraw the AC power cord from the wall socket.**

PREPARATIONS

English

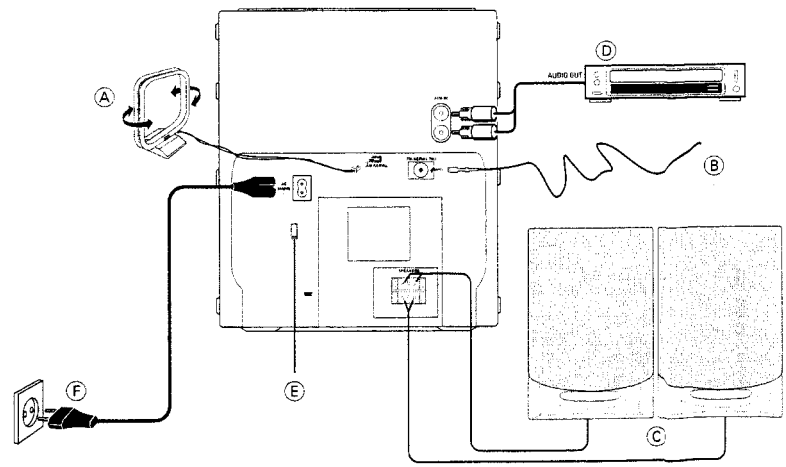
Inserting the batteries into the Remote Control

- Insert the batteries (Type R03 or AAA) into the remote control as shown inside the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement use type R03 or AAA batteries.

Rear Connection



Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Adjust the position of the AM loop antenna for the best reception.

Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

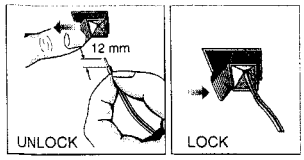
Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speaker Connections

- Connect the right speaker to terminal R, with the red wire to + and the black wire to −.
- Connect the left speaker to terminal L with the red wire to + and the black wire to −.
- Clip the stripped portion of the speaker wire as shown.

PREPARATIONS



Ⓓ Connecting other equipment to your system

You can connect TV, Laser Disc or VCR audio left and right outputs to the AUX IN terminal at the rear of the system.

Ⓔ Adjusting the Operating Voltage

(For specific versions only)

Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓕ AC Power Supply

After all other connections have been made, connect the AC power cord to the set and to the wall outlet.

REMOTE CONTROL

Remote Control Functions

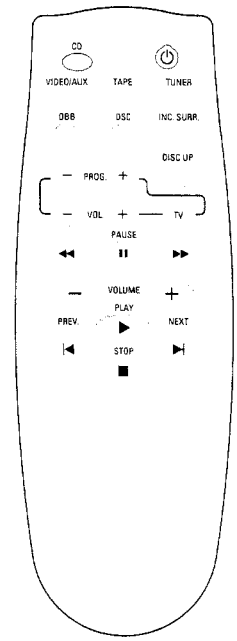
- First select the source you wish to control by pressing one of the source selection keys on the remote control (eg. CD, TUNER, TAPE or VIDEO/AUX).
- Then select the desired function (PLAY, NEXT, etc.).

Notes:

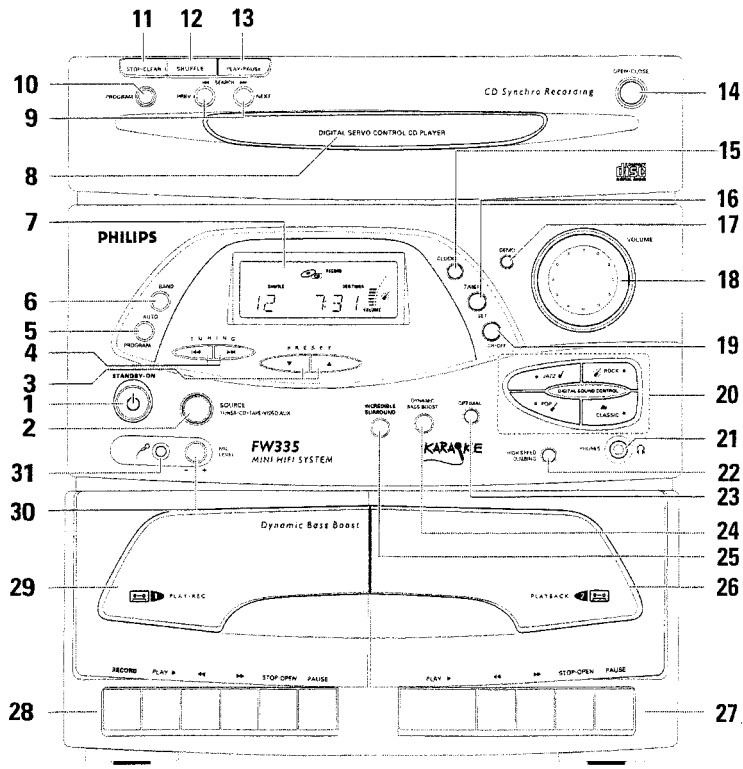
- *Whenever a remote control button is pressed, the source icon on the set display will flicker. This indicates the remote control signal is received by the set.*
- *For TV/VCR operation, the accessory TV or VCR must use the RC-5 code remote control system.*

⏻ ..... to switch the unit to standby mode.
CD ..... to select CD mode.
VIDEO/AUX ..... to select VIDEO/AUX or external mode.
TAPE ..... to select TAPE mode.
TUNER ..... to select TUNER mode.
INC. SURR. ..... to switch on or off the Incredible Surround sound effect.
DSC ..... to select digital sound control: JAZZ, ROCK, CLASSIC, POP or OPTIMAL.
DBB ..... to switch on and off dynamic bass boost.
DISC UP ..... not functional for this model.
PROG. +/− ..... to select previous/next channel for TV/VCR.
VOL. +/− ..... to adjust the TV (RC5 code) volume.
TV ..... to select TV mode.
PAUSE ⏸ ..... to interrupt playback in CD mode.
◀◀ / ▶▶
for TUNER ..... to select a lower/higher frequency.
for CD ..... to search a particular passage.
VOLUME +/− ...to adjust the volume of the system.
PLAY ▶ ..... to start playback in CD mode.
STOP ■ ..... to stop playback in CD mode.

⏮ PREV. / NEXT ⏭
for TUNER ..... to select a lower/higher tuner preset station.
for CD ..... to select previous/next CD track.



CONTROLS



Front View

1 **STANDBY-ON**
– to switch the set on or to standby mode.

2 **SOURCE**
– to select the following :
TUNER : to switch to Tuner mode.
CD : to switch to CD mode.
TAPE : to switch to Tape mode.
VIDEO/AUX : to switch to VIDEO/AUX mode (for external sources, e.g. TV, Laser Disc or VCR sound).

3 **PRESET ▲ or ▼**
– to select a radio station in memory. Also use for clock and timer setting.

4 **TUNING ⏮ or ⏭**
– to tune to radio stations:
⏮ : lower frequencies
⏭ : higher frequencies
Also use for clock and timer setting.

5 **AUTO PROGRAM**
– to program preset stations automatically or manually.

6 **BAND**
– to select the waveband: FM or MW.

7 **DISPLAY**
– to display the current setting of the set.

8 **CD TRAY**

9 **PREV / NEXT (⏮ SEARCH ⏭)**
– to skip to the beginning of the current or previous/ next track or to search backward/forward.

10 **PROGRAM**
– to program CD tracks.

11 **STOP•CLEAR**
– to stop CD play or to clear a program.

12 **SHUFFLE**
– to play all the tracks in random order.

CONTROLS

English

13 PLAY•PAUSE
- to start or interrupt CD play.

14 OPEN•CLOSE
- to open or close the CD tray.

15 CLOCK
- to set the clock.

16 TIMER SET
- to set the timer.

17 DEMO
- to display the various features offered by the system.

18 VOLUME
- to adjust the volume level.

19 TIMER ON•OFF
- to switch the timer on or off.

20 DIGITAL SOUND CONTROL (DSC)
- to select the desired sound effect : JAZZ, ROCK, CLASSIC or POP.

21 PHONES 🎧
- to connect headphones jack.

22 HIGH SPEED DUBBING
- to dub from **TAPE DECK 2** to **TAPE DECK 1** at high speed.

23 OPTIMAL
- to select the sound setting that is tuned to the acoustics of the supplied speakers.

24 DYNAMIC BASS BOOST (DBB)
- to switch on bass boost to enhance bass response or to switch off bass boost.

25 INCREDIBLE SURROUND
- to switch on or off the Incredible Surround sound effect.

26 TAPE DECK 2

27 TAPE DECK 2 CASSETTE OPERATION
- **PLAY ▶** : to start playback.
- **◀◀** : to rewind the cassette.
- **▶▶** : to fast forward the cassette.
- **STOP•OPEN** : to stop playback or to open the cassette compartment.
- **PAUSE** : to interrupt playback

28 TAPE DECK 1 CASSETTE OPERATION
- **RECORD** : to start recording.
- **PLAY ▶** : to start playback.
- **◀◀** : to rewind the cassette.
- **▶▶** : to fast forward the cassette.
- **STOP•OPEN** : to stop playback or to open the cassette compartment.
- **PAUSE** : to interrupt playback or recording.

29 TAPE DECK 1

30 MIC LEVEL
- to adjust the mixing level for karaoke or microphone recording.

31 MIC
- to connect microphones jack.

OPERATING THE SYSTEM

Demo mode

The system has a demonstration mode that shows the various features offered by the system. Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.

To stop demonstration mode
- Press **DEMO**, **STANDBY - ON** or **SOURCE** button on the system (or ⏻, **CD**, **TUNER**, **TAPE** or **VIDEO/AUX** on remote control) to stop the demonstration mode.

To switch on demonstration mode
- Press **DEMO**.
  → The display will show "WELCOME TO THE AUDIO WORLD", then a demonstration of the various features will follow.

Important:
Before you begin operating the system, complete the preparation procedures.

Switching the system ON

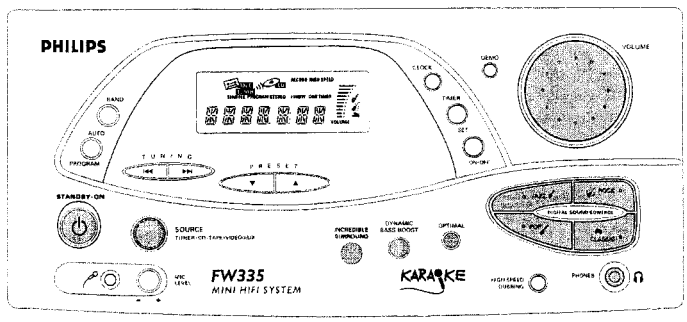
- Press **STANDBY-ON** or **SOURCE** (or **CD**, **TUNER**, **TAPE** or **VIDEO/AUX** on the remote control).

Switching the system to standby mode

- Press **STANDBY-ON** again (or ⏻ on the remote control).

OPERATING THE SYSTEM

English



Selecting the Sound Source

- Press **SOURCE** to select either TUNER, CD, TAPE or VIDEO/AUX (or **CD**, **TUNER**, **TAPE** or **VIDEO/AUX** on the remote control).
  → The display indicates the selected sound source.

You can also select the sound source directly by selecting the respective PLAY button for CD mode or the PRESET, BAND or TUNING button for TUNER mode.

Note:
For external source, make sure that you have connected the audio left and right outputs of the external equipment (TV, VCR or Laser Disc player) to the AUX IN sockets at the rear of the set.

Volume Adjustment

Rotate **VOLUME** right or left (or press **VOLUME** + or − on the remote control) to increase or decrease the sound level.

For Personal Listening
Connect the headphones jack to the PHONES 🎧 socket at the front of the set. The speakers will be muted.

Digital Sound Control (DSC)

- To enjoy a special sound effect, press **JAZZ** (🎷), **ROCK** (🎸), **CLASSIC** (🎻) or **POP** (🎤).
- You can also press **DSC** on the remote control to select the respective sound setting, including **OPTIMAL**.

Optimal Sound

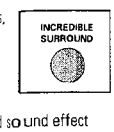
- Press **OPTIMAL** to hear the sound setting that is tuned to the acoustics of the supplied speakers.

Dynamic Bass Boost (DBB)

- Press **DBB** on the set or remote control to enhance the bass response.
  → The DBB flag lights up.

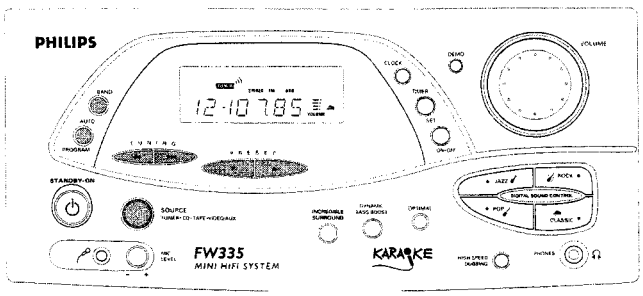
Incredible Surround

- In additional to all other sound settings, you can switch on or off the incredible surround sound feature by pressing **INCREDIBLE SURROUND** on the set or remote control.
  → This creates a phenomenal surround sound effect even if the speakers are positioned close to the system. The sound becomes "incredibly" spatial.
  → The INCREDIBLE SURROUND button lights up.



TUNER

English



Tuning to radio stations

1 Press **SOURCE** to select TUNER.
2 Press **BAND** to select the desired waveband: FM or MW.
3 Press **TUNING** ⏮ or ⏭ for more than one second.
→ The display will show 'SEARCH' until a station with sufficient signal strength is found.

- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press **TUNING** ⏮ or ⏭ until the display shows the right frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 20 stations in the memory. When a preset station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **BAND** to select the desired waveband: FM or MW.
2 Press **AUTO PROGRAM** for more than one second to start the automatic programming.
→ PROGRAM flashes and 'AUTO' is displayed.
→ Every available station will be stored automatically. The frequency and preset number will be displayed briefly.
→ It will stop searching when all the available stations are stored or the memory for 20 preset stations is used.

- You can cancel the automatic programming by pressing **AUTO PROGRAM**; **TUNING** ⏮ or ⏭ ; **PRESET** ▼ or ▲ ; or **BAND**.

Note:
If you want to reserve a section of preset numbers 1 - 9, select preset 10 before starting automatic programming, now only the preset numbers 10 to 20 will be programmed.

Manual programming

1 Press **AUTO PROGRAM** for less than one second.
→ PROGRAM flashes on the display.
2 Press **BAND** to select the desired waveband: FM or MW.
3 Press **TUNING** ⏮ or ⏭ to tune to the desired frequency.
4 Press **PRESET** ▼ or ▲ to select a preset number.
5 Press **AUTO PROGRAM** again.
→ PROGRAM disappears, and the station is stored.

- Repeat the above procedure to store other preset stations.

Tuning to Preset Stations

- Press **PRESET** ▼ or ▲ (or ⏮ **PREV** or **NEXT** ⏭ on the remote control) to select the desired preset number.
→ The preset number, frequency and waveband appear on the display.

Changing the FM/MW tuning grid

(for specific versions only)

For FM Band : change from 50kHz to 100kHz or vice versa
For MW Band : change from 9kHz to 10kHz or vice versa

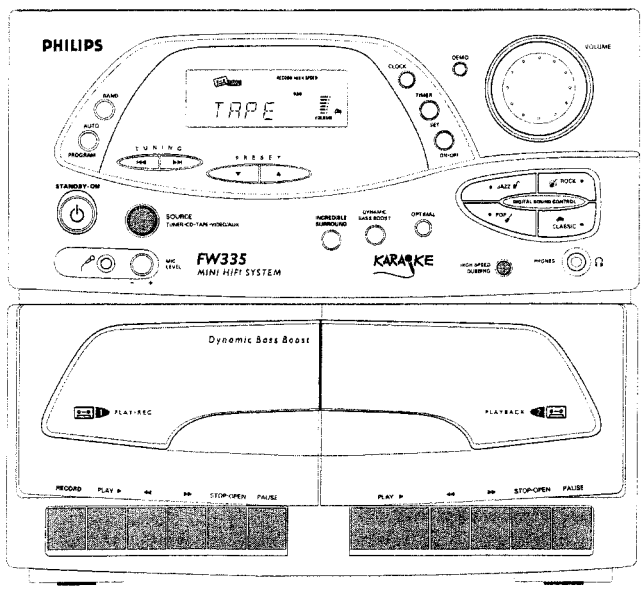
Changing of tuning grid will erase all previously stored preset stations.

1 Switch the unit to standby mode and disconnect the unit from the AC power supply (pull out the AC power cord).
2 Keep **AUTO PROGRAM** and **TUNING** ⏭ depressed, while re-connecting the system to the AC power supply again.
→ Display briefly shows "TUNER" and then followed by "GRID 9" or "GRID 10".

Note:
GRID 9 indicates that the tuning grid is in step of 50 kHz in FM band and 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 100 kHz in FM band and 10 kHz in MW band.

CASSETTE DECK

English



Loading a cassette

- Press **STOP•OPEN**.
- The cassette compartment door opens.
- Load the cassette with the open side downward and the full spool to the left.
- Close the cassette compartment door.

Tape Playback

1 Press **SOURCE** to select TAPE.
2 Load the cassette into the desired **cassette deck**.
3 Press **PLAY** ▶ to start playback.
4 Press **STOP•OPEN** to end playback.

Fast Forward/Rewinding

1 You can rewind or fast forward the cassette by pressing ◀◀ or ▶▶ respectively.
2 Press **STOP•OPEN** to stop fast forwarding or rewinding.

Note:
It is possible to fast forward or rewind a cassette when the set is in another source mode (e.g. TUNER, CD or VIDEO/AUX mode).

Continuous playback of two cassettes

1 Press **SOURCE** to select TAPE.
2 Load the cassettes in **tape deck 1** and **tape deck 2**.
3 Press **PLAY** ▶ on **tape deck 2**.
4 Press **PAUSE** on **tape deck 1**.
5 Press **PLAY** ▶ on **tape deck 1**.
→ Playback will begin with **tape deck 2** and will continue with **tape deck 1** when **tape deck 2** ends.
6 Press **STOP•OPEN** if you want to stop playback before the end of the cassette in **tape deck 1** or **tape deck 2**.

Recording (TAPE DECK 1)

1 Press **SOURCE** to select TUNER, CD or VIDEO/AUX.
2 Load a blank cassette into **tape deck 1**.
3 Press **RECORD** on **tape deck 1** to start recording.
→ The RECORD flag starts flashing.
4 Press **STOP•OPEN** on **tape deck 1** to stop recording.

Note:
During recording, it is not possible to listen to another sound source.

CASSETTE DECK

English

Dubbing cassettes (from Tape Deck 2 to Tape Deck 1)

1 Load the pre-recorded cassette into **tape deck 2** and a blank cassette into **tape deck 1**.
→ Make sure that both cassettes have their full spools to the left.

• For high speed recording, press **HIGH SPEED DUBBING**.
→ HIGH SPEED appears on the display.

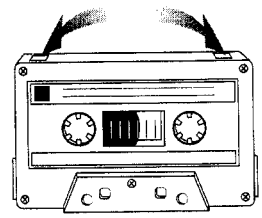
2 Press **PAUSE** on **tape deck 1**.
3 Press **RECORD** on **tape deck 1**.
→ RECORD appears on the display.
4 Press **PLAY ▶** on **tape deck 2**.
→ Recording will start automatically.
5 Press **STOP•OPEN** on **tape deck 1** and **tape deck 2** to stop dubbing.

Notes:
- *At the end of side A, flip the cassettes to side B and repeat the procedure.*
- *Dubbing of cassettes is only possible in the Tape mode. To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing operation in the Tape mode, the sound is reduced to a low volume.*

General Information

- For recording, use only a cassette of IEC type I (normal cassette).
- The tape in the cassette is secured at both ends with leader tape. At the beginning and end of a cassette, nothing will be recorded for six to seven seconds.
- The recording level is set automatically, regardless of the position of VOLUME.
- Check and tighten slack tape with a pencil before use. Slack tape may get jammed or may burst in the mechanism.
- To prevent accidental recording, break out the tab on the left shoulder of the cassette side. To re-record the cassette, cover each hole with cellophane tape.

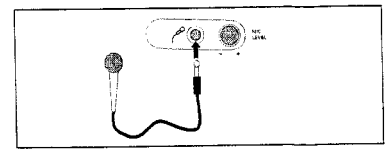
Erasure Prevention Tabs



- C-120 tape is extremely thin and may be easily deformed or damaged. It is not recommended for use in this unit.
- Store the cassettes at room temperature and do not put them too close to a magnetic field (for example, transformers, TVs or speakers).

KARAOKE

Karaoke



Microphone mixing

1 Connect the microphone to the mic socket (🎤).
2 Press **SOURCE** to select TUNER, CD, TAPE or VIDEO/AUX.
3 Play the selected source.
4 Adjust the volume with **VOLUME** control.
5 Adjust the **MIC LEVEL** control to the mixing level that you want.
6 Start singing or talking through the microphone.

Note:
- *To prevent acoustics feedback (for example, a loud howling sound), adjust the MIC LEVEL control to the minimum before you plug in the microphone.*

Recording the mixed sound

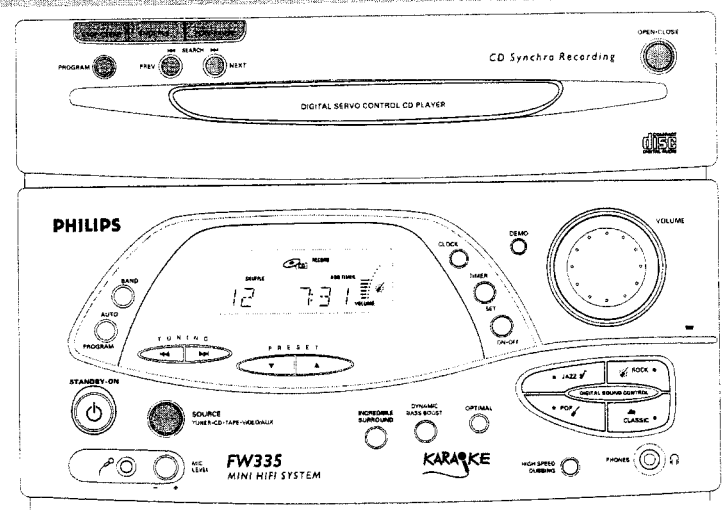
During microphone mixing, you can record the mixed sound on a cassette in TAPE DECK 1.

1 Load a blank cassette in or **tape deck 1**.
2 Press **RECORD**.

Notes:
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *It is not possible to record the mixed sound through a microphone during cassette Dubbing mode.*

CD PLAYER

English



Warning!

1) This set is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc, which may damage the CD mechanism.
2) Do not load more than one disc into the tray.

In addition to the conventional 12-cm disc, 8-cm disc can also be used without an adaptor.

Loading a Disc

1 Press **SOURCE** to select CD.
2 Press **OPEN•CLOSE**.
→ The CD tray slides out.
3 Load a disc with ***printed side up***.
4 Press **OPEN•CLOSE** to close the CD tray.
→ The total number of tracks and playing time appear on the display.

Playing a Disc

1 Press **PLAY•PAUSE** (or **PLAY ▶** on the remote control) to start play.
→ The track number and elapsed playing time of the current track appear on the display.
• To interrupt play, press **PLAY•PAUSE** (or **PAUSE ❚❚** on the remote control).
→ The playing time flashes.
• To resume play, press **PLAY•PAUSE** again (or **PLAY ▶** on the remote control).
2 To stop play, press **STOP•CLEAR** (or **STOP ■** on the remote control).

Note:
When the CD has stopped playing, the set will switch to the standby mode automatically after 15 minutes if no button is pressed.

Selecting a desired track

Selecting a desired track at the stop mode

1 Press **PREV** or **NEXT** (**I◀ PREV** or **NEXT ▶I** on the remote control) until the desired track appears on the display.
2 Press **PLAY•PAUSE** (or **PLAY ▶** on the remote control) to start playback.
→ The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playmode

1 Press **PREV** or **NEXT** (or **I◀ PREV** or **NEXT ▶I** on the remote control) until the desired track appears on the display.
→ The selected track number and elapsed playing time appear on the display.
• If you press **PREV** once it will skip to the beginning of the current track and play the track again.

CD PLAYER

English

Searching for a particular passage during play

- Press and hold **SEARCH** ⏮ or ⏭ (or ◀◀ or ▶▶ on the remote control) until the desired passage is located. During the search, the sound is played faster than normal at a reduced volume. Play returns to normal when **SEARCH** ⏮ or ⏭ is released.

Shuffle

SHUFFLE – playing all the tracks of the disc in random order. It can also be used during program mode.

To shuffle all the tracks

1 Press **SHUFFLE**.
   → "SHUFFLE" appears briefly on the display.
   → The SHUFFLE flag and the track selected at random appear on the display.
   → The tracks will now be played in random order, until you press **STOP•CLEAR**.
2 Press **SHUFFLE** again to resume normal play.
   → The SHUFFLE flag disappears from display.

Programming Tracks

Programming tracks of the loaded CD is possible when CD playback is stopped. The display will indicate the total tracks stored in the program. Up to 20 tracks can be stored in the memory in any order. When 20 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1 Load the desired disc in the disc tray.
2 Press **PROGRAM** to start programming.
   → The PROGRAM flag flashes on the display.
3 Press **PREV** or **NEXT** to select the desired track.
4 Press **PROGRAM** to store the track.
- Repeat steps **3** to **4** to store other tracks.

5 Press **STOP•CLEAR** once to end programming mode.
   → The total number of tracks programmed and total playing time appear on the display.

Playing the program

1 Press **PLAY•PAUSE** to start program playback.
   → The track number and elapsed playing time of the current track appear on the display.
2 Press **STOP•CLEAR** to stop program playback.

Reviewing the program

Reviewing of program is only possible when CD playback is stopped.

- Press **PREV** or **NEXT** repeatedly to review the programmed tracks.

Erasing the program (when playback is stopped)

- Press **STOP•CLEAR** or **OPEN•CLOSE**.
   → "PROGRAM CLEARED" appears on the display.

Note:
Program is also erased when the set is disconnected from the power supply.

CD Recording

During CD recording,

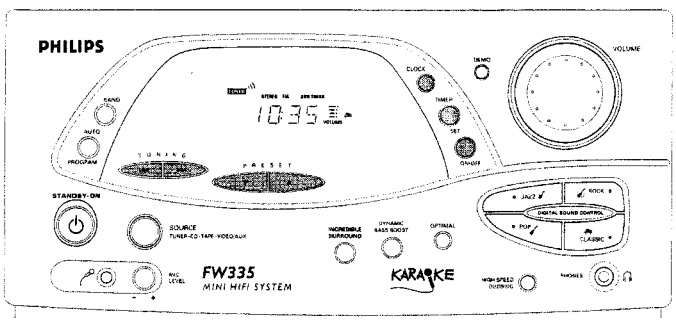
- it is not advisable to fast forward/rewind your cassette in TAPE DECK 2.
- it is not possible to listen to another sound source.

CD Recording

1 Load a blank cassette (full spool to the left) into **tape deck 1**.
2 Press **SOURCE** to select CD.
3 Load a disc into the disc tray.
4 Press **PREV** or **NEXT** to select the desired track. If desired, you can program the tracks in the order you want them to be recorded (see Programming Tracks).
5 Press **RECORD** on cassette **tape deck 1** to start recording.
   → The RECORD flag flashes on the display.
   → CD starts playing.
6 Press **STOP•CLEAR** on CD and **STOP•OPEN** on cassette **tape deck 1** to stop recording.

CLOCK SETTING

TIMER SETTING



Setting the clock

The clock will display in 24-hour mode, e.g. 00:00 or 23:59.

1 Press **CLOCK**.
   → "00:00" starts flashing.
2 Set the hour with **PRESET** ▼ or ▲.
3 Set the minute with **TUNING** ⏮ or ⏭.
4 Press **CLOCK** again to store the setting.
   → The clock starts running.

Note:
– *When a power interruption occurs, the clock settings are erased.*

Setting the Timer

- The system can switch on to TUNER or CD mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer works only once for each setting.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

Timer Setting

English

1 Press **TIMER SET**.
   → The TIMER flag flashes.
2 Press **PRESET** ▲ to select the desired source.
   → The display will switch as follows:
   TUNER → CD → TUNER ...
3 Press **TIMER SET** to confirm your selection.
   → The display will show "ON 00:00" and "00:00" flashes.
4 Press **PRESET** ▼ or ▲ to set the hour for the timer to start.
5 Press **TUNING** ⏮ or ⏭ to set the minutes for the timer to start.
6 Press **TIMER SET** to store the start time.
   → The TIMER is now set.
   → The TIMER flag remains lit.

To stop the TIMER

- Press **TIMER ON•OFF** on the set.
   → The TIMER is now off.

To start the TIMER again

- Press **TIMER ON•OFF** on the set.
   → The display will show the last set start time of the TIMER and its flag.
   → The TIMER flag remains lit.

Notes:
1. *If the source selected is TUNER, the last tuned frequency will be switched on.*
2. *If the source selected is CD, the first track of the disc will be played. If the CD tray is empty, the TUNER source will be selected instead.*

MAINTENANCE

English

Maintenance

Cleaning the Cabinet

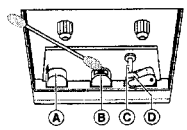
- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs

- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for analog records.

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads Ⓐ and Ⓑ, the capstan Ⓒ, and pressure roller Ⓓ after every 50 hours of tape operation.



- Use a cotton swab slightly moistened with cleaning fluid or alcohol.

Demagnetizing the heads

- Use a demagnetizing cassette available at your dealer.

TROUBLESHOOTING GUIDE

English

Warning! Under no circumstances should you try to repair the set yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the set in for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

SYMPTOM	POSSIBLE CAUSE	REMEDY
RADIO RECEPTION		
The STEREO indicator flashes.	The signal is too weak.	Adjust the antenna.
Severe hum or noise.	The signal strength is too weak.	Adjust the antenna.
	The TV or VCR is too close to the stereo system.	Separate the stereo system from the TV or VCR.
		Connect an external antenna for better reception.
CASSETTE DECK OPERATION		
Recording is not possible.	No cassette in the cassette deck.	Insert a blank cassette into the cassette deck.
	The protection tab has been broken.	Put a piece of clear adhesive tape over the opening.
Recording or playback cannot be made or there	Dirty tape heads.	See section on cassette deck maintenance.
is a decrease in audio level.	Magnetic build-up in the record/playback head.	Use demagnetizing cassette.
Excessive wow or flutter, or sound drop-out.	Contamination of the capstans or pressure rollers.	See section on cassette deck maintenance.
CD PLAYER OPERATION		
"NO DISC" is displayed.	The disc is inserted upside down.	Place CD with printed side up.
	Moisture condensation.	Wait until lens has adjusted to normal room temperature.
	There is no disc in the CD tray.	Insert a CD.
	The CD is dirty, badly scratched or warped.	Replace or clean the CD.
GENERAL		
Set not working.	Set does not react when buttons are pressed.	Press STANDBY-ON to switch the unit off, then switch it on again. Or, unplug the AC power plug from the wall outlet, then plug it in again.
No or poor sound.	Volume is not turned up.	Adjust VOLUME.
	The headphones are connected.	Disconnect the headphones.
	Speakers are not connected or are connected	Check that the speakers are connected correctly.
	wrongly.	Make sure that the stripped speaker wire is clamped.
Reversed left and right sound.	Speakers are connected wrongly.	Check the speaker connections and speaker location.

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TROUBLESHOOTING GUIDE

English

Lack of bass sound or apparently imprecise physical location of musical instruments.	Speakers are connected wrongly.	Check the speaker connection for proper phasing, red/black wires to red/black terminals.
Clock blinking.	There was a power disruption.	Reset the clock.
Remote control has no effect on	The distance to the system is too large.	Reduce the distance.
the set.	Batteries are inserted incorrectly.	Insert the batteries correctly.
	Batteries are exhausted.	Replace the batteries.
	Wrong sound source is selected.	Select the sound source before pressing the function button (PLAY, PREV./NEXT, etc.).
Timer not working.	Timer not on.	Press TIMER ON•OFF on the set to switch on the timer.
	Dubbing/recording is active.	Stop dubbing/recording.
"PRESS DEMO TO EXIT" is displayed.	Demo mode is switched on.	Press STANDBY-ON or DEMO to switch off the demo.

18

Dismantling & Service hints

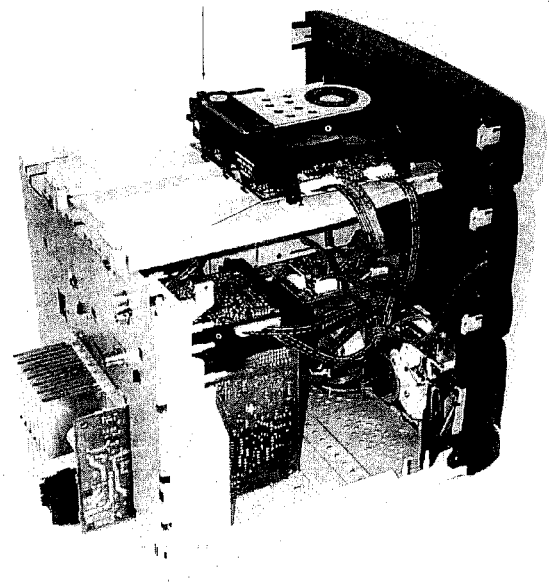


Figure 1

1) Remove the top cabinet.
2) Remove the 2 screw on the CD module.

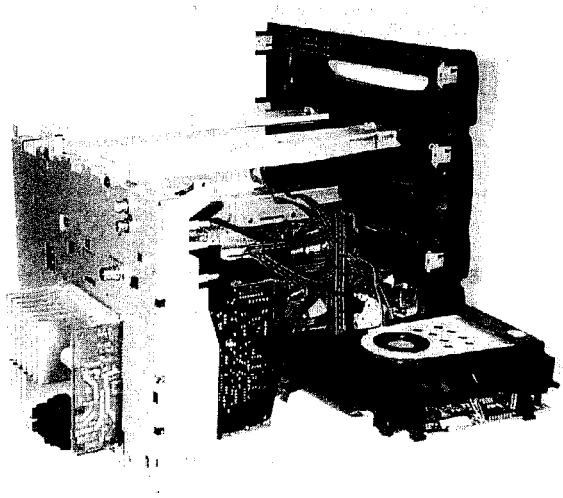


Figure 2

3) Place the CD module on the side for servicing.

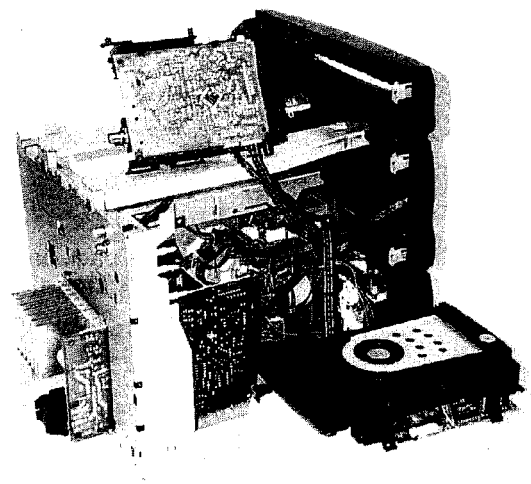


Figure 3

4) Remove the screw for the tuner on the back panel.
Figure 3 show the tuner & CD service

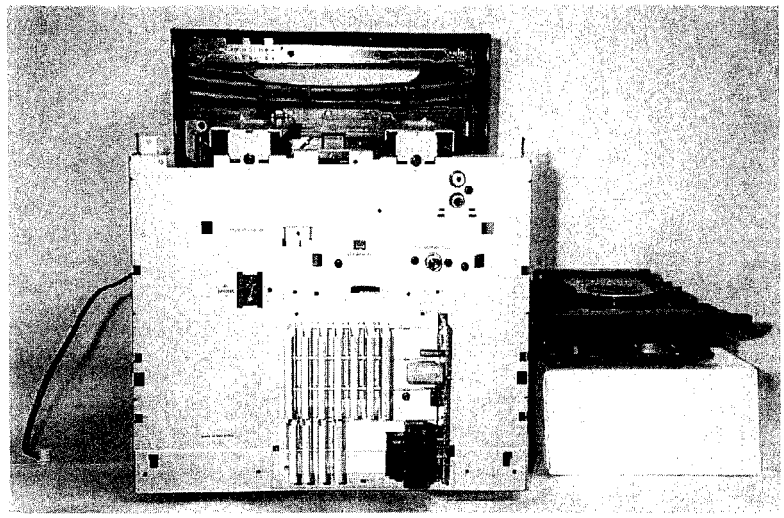


Figure 4

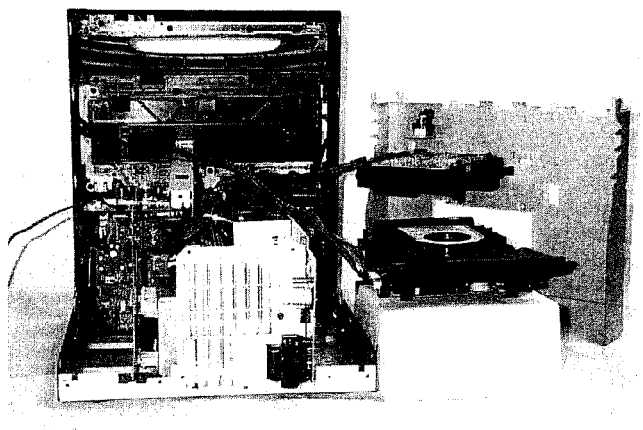


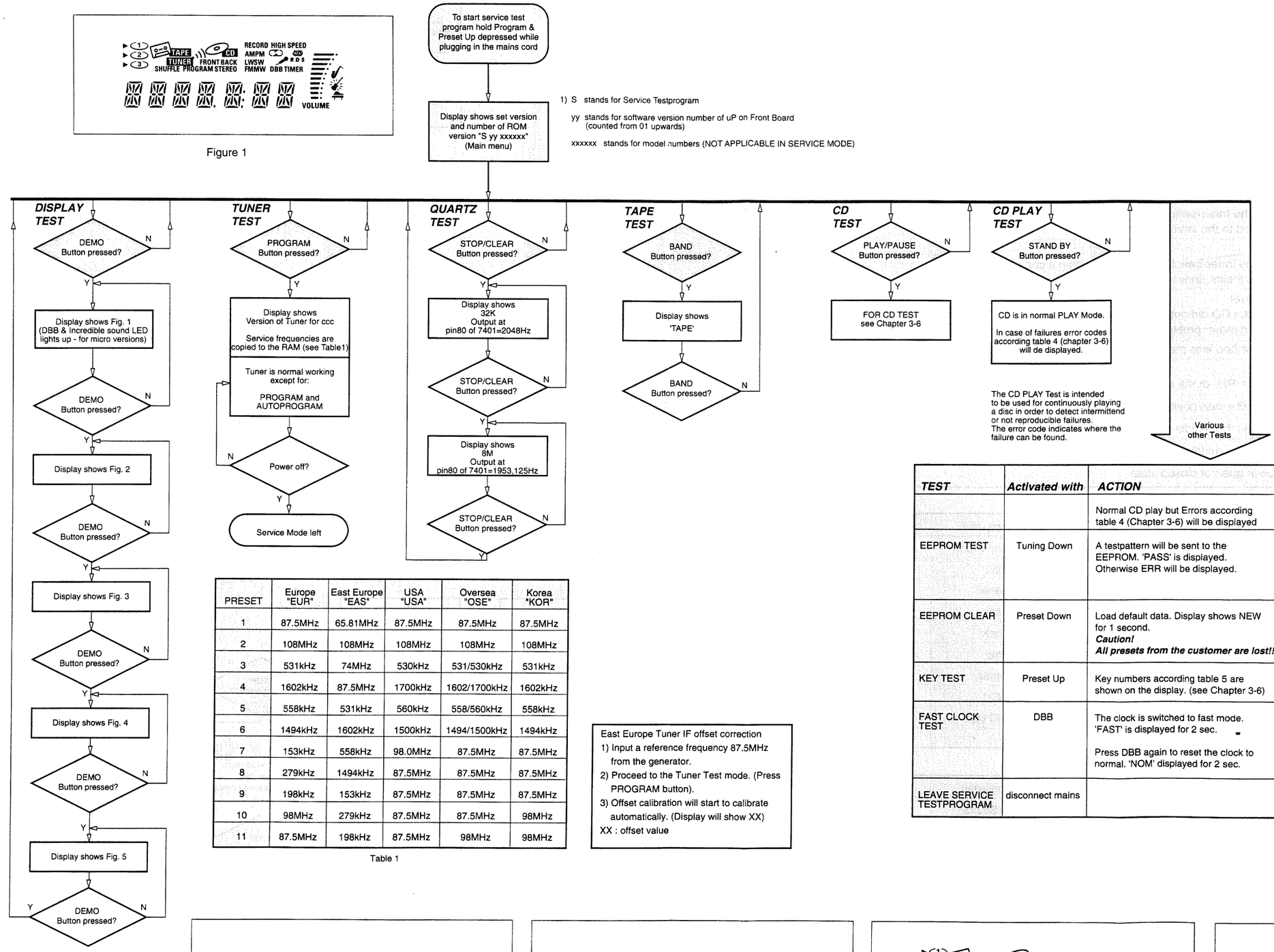
Figure 5

5) Remove the back panel in-order to service the power, transformer board or the AF & front board. Figure 5 show the possible service position.

3-3

SERVICE TEST PROGRAM

Figure 1


To start service test program hold Program & Preset Up depressed while plugging in the mains cord
Display shows set version and number of ROM version "S yy xxxxxx" (Main menu)
1) S stands for Service Testprogram
yy stands for software version number of uP on Front Board (counted from 01 upwards)
xxxxxx stands for model numbers (NOT APPLICABLE IN SERVICE MODE)
DISPLAY TEST
DEMO Button pressed?
Display shows Fig. 1 (DBB & Incredible sound LED lights up - for micro versions)
DEMO Button pressed?
Display shows Fig. 2
DEMO Button pressed?
Display shows Fig. 3
DEMO Button pressed?
Display shows Fig. 4
DEMO Button pressed?
Display shows Fig. 5
DEMO Button pressed?
TUNER TEST
PROGRAM Button pressed?
Display shows Version of Tuner for ccc
Service frequencies are copied to the RAM (see Table1)
Tuner is normal working except for:
PROGRAM and AUTOPROGRAM
Power off?
Service Mode left
QUARTZ TEST
STOP/CLEAR Button pressed?
Display shows 32K Output at pin80 of 7401=2048Hz
STOP/CLEAR Button pressed?
Display shows 8M Output at pin80 of 7401=1953,125Hz
STOP/CLEAR Button pressed?
TAPE TEST
BAND Button pressed?
Display shows 'TAPE'
BAND Button pressed?
CD TEST
PLAY/PAUSE Button pressed?
FOR CD TEST see Chapter 3-6
CD PLAY TEST
STAND BY Button pressed?
CD is in normal PLAY Mode.
In case of failures error codes according table 4 (chapter 3-6) will de displayed.
The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittend or not reproducible failures. The error code indicates where the failure can be found.
Various other Tests
Y
N

PRESET	Europe "EUR"	East Europe "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	530kHz	531/530kHz	531kHz
4	1602kHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz
5	558kHz	531kHz	560kHz	558/560kHz	558kHz
6	1494kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz
7	153kHz	558kHz	98.0MHz	87.5MHz	87.5MHz
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	153kHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	279kHz	87.5MHz	87.5MHz	98MHz
11	87.5MHz	198kHz	87.5MHz	98MHz	98MHz

Table 1

East Europe Tuner IF offset correction
1) Input a reference frequency 87.5MHz from the generator.
2) Proceed to the Tuner Test mode. (Press PROGRAM button).
3) Offset calibration will start to calibrate automatically. (Display will show XX)

XX : offset value

TEST	*Activated with*	*ACTION*
		Normal CD play but Errors according table 4 (Chapter 3-6) will be displayed
EEPROM TEST	Tuning Down	A testpattern will be sent to the EEPROM. 'PASS' is displayed. Otherwise ERR will be displayed.
EEPROM CLEAR	Preset Down	Load default data. Display shows NEW for 1 second. ***Caution!*** ***All presets from the customer are lost!!***
KEY TEST	Preset Up	Key numbers according table 5 are shown on the display. (see Chapter 3-6)
FAST CLOCK TEST	DBB	The clock is switched to fast mode. 'FAST' is displayed for 2 sec. Press DBB again to reset the clock to normal. 'NOM' displayed for 2 sec.
LEAVE SERVICE TESTPROGRAM	disconnect mains	

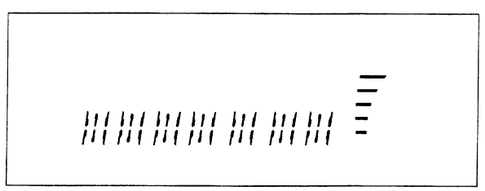


Figure 2

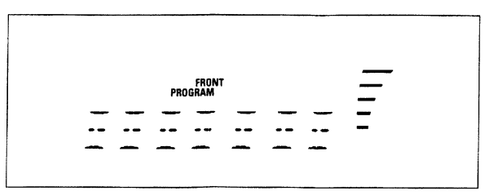


Figure 3

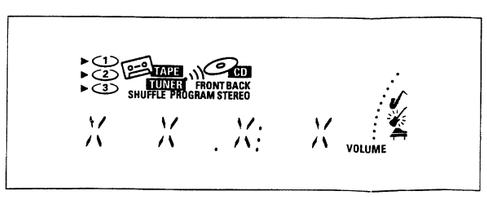


Figure 4

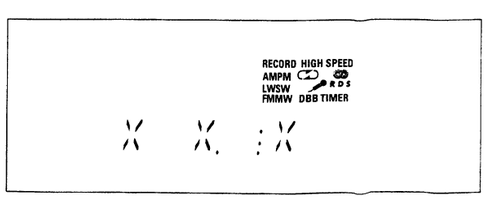


Figure 5

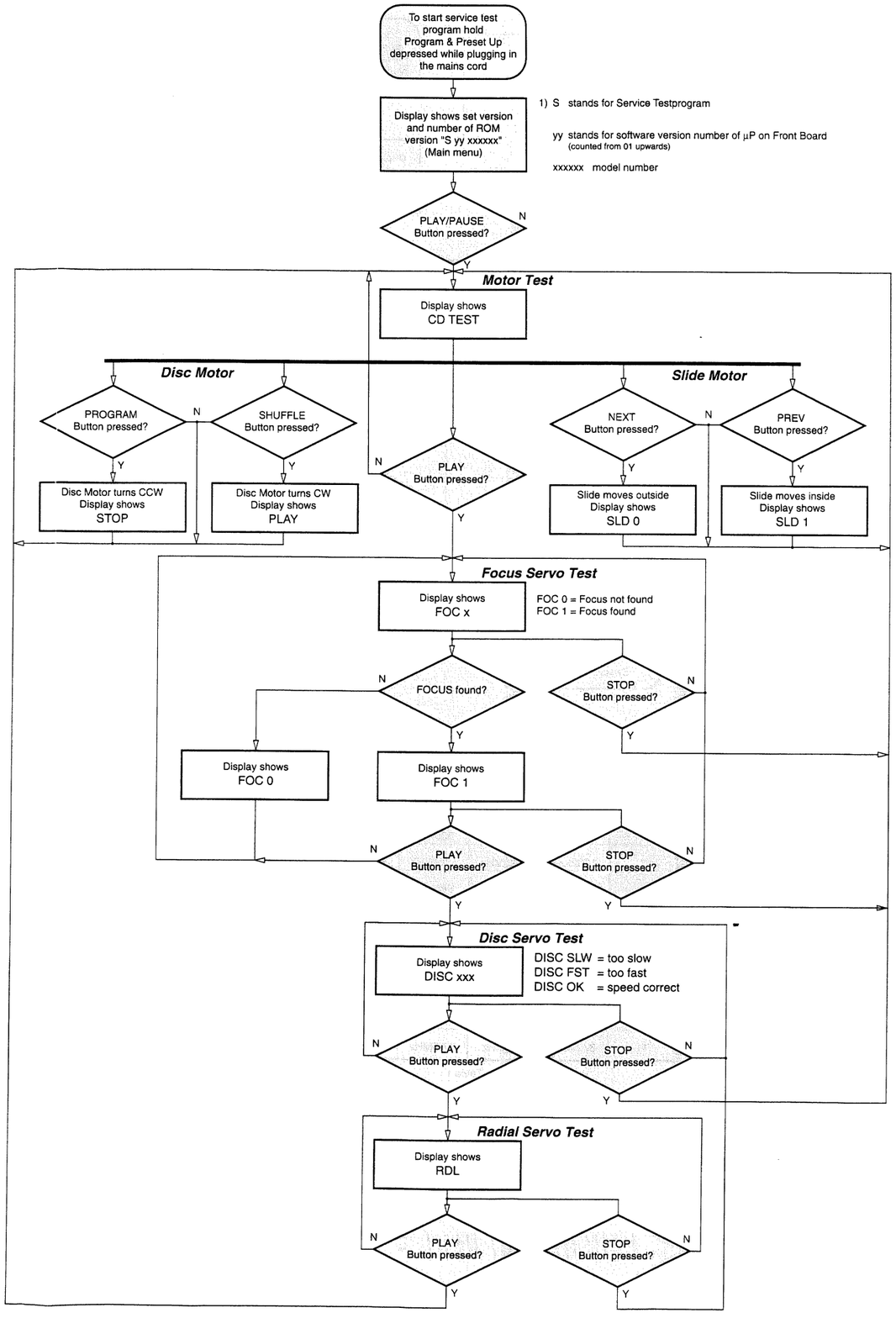
Error number	CD Error description
E 1002	Focus error Triggered when the focus could not found within a certain time when starting up the CD, or when the focus is lost for more than a certain time during playing the CD.
E 1007	Subcode error (no subcode within certain time)
E 1008	TOC error Triggered when during reading the TOC the lead-in(track nr. 0) is left. This can be caused by a misaligned Inner-switch or by a disc with a mispositioned lead-in.
E 1010	Radial error Triggered when the radial servo is not on track for a certain time during playing the CD.
E 1011	Sledge error Generated when the Inner-switch did not open within a certain time when the pickup is moved to the inner position.
E 1012	Fatal sledge error Triggered when the Inner-switch did not close within a certain time when moving the pickup inside. Inner-switch or sledge motor problem.
E 1013	Turnatble motor error Generated when the CD did not reach 75% of speed during startup within a certain time. Disc motor problem.
E 1014	Jump-offtrack error (too less grooves within time)
E 1020	PLL locked error Triggered when the PLL of the decoder did not locked within a certain time.
E 1070	Carousel blocked in a disc position
E 1071	Carousel blocked in the middle
E 1075	Drawer blocked in the middle
E 1076	Drawer blocked in open or closed state

For FW335

Key activated	Display	Key activated	Display	Key activated	Display
Stop/Clear	01	Clock Set	11	Incredible Sound	21
Program (CD)	02	Timer Set	12	Dbb	22
Shuffle	03	Timer On/Off	13	Optimal	23
Search/Prev	04	Demo	14	Jazz	24
Play/Pause	05	Tuning Down	15	Rock	25
Search/Next	06	Tuning Up	16	Pop	26
CD Open/Close	07	Preset Down	17	Classic	27
Program (TU)	08	Preset Up	18	HSD	28
Band	09	Power/Standby	19	any RC keys	RC
RDS Mode	10	Scroll Source	20		

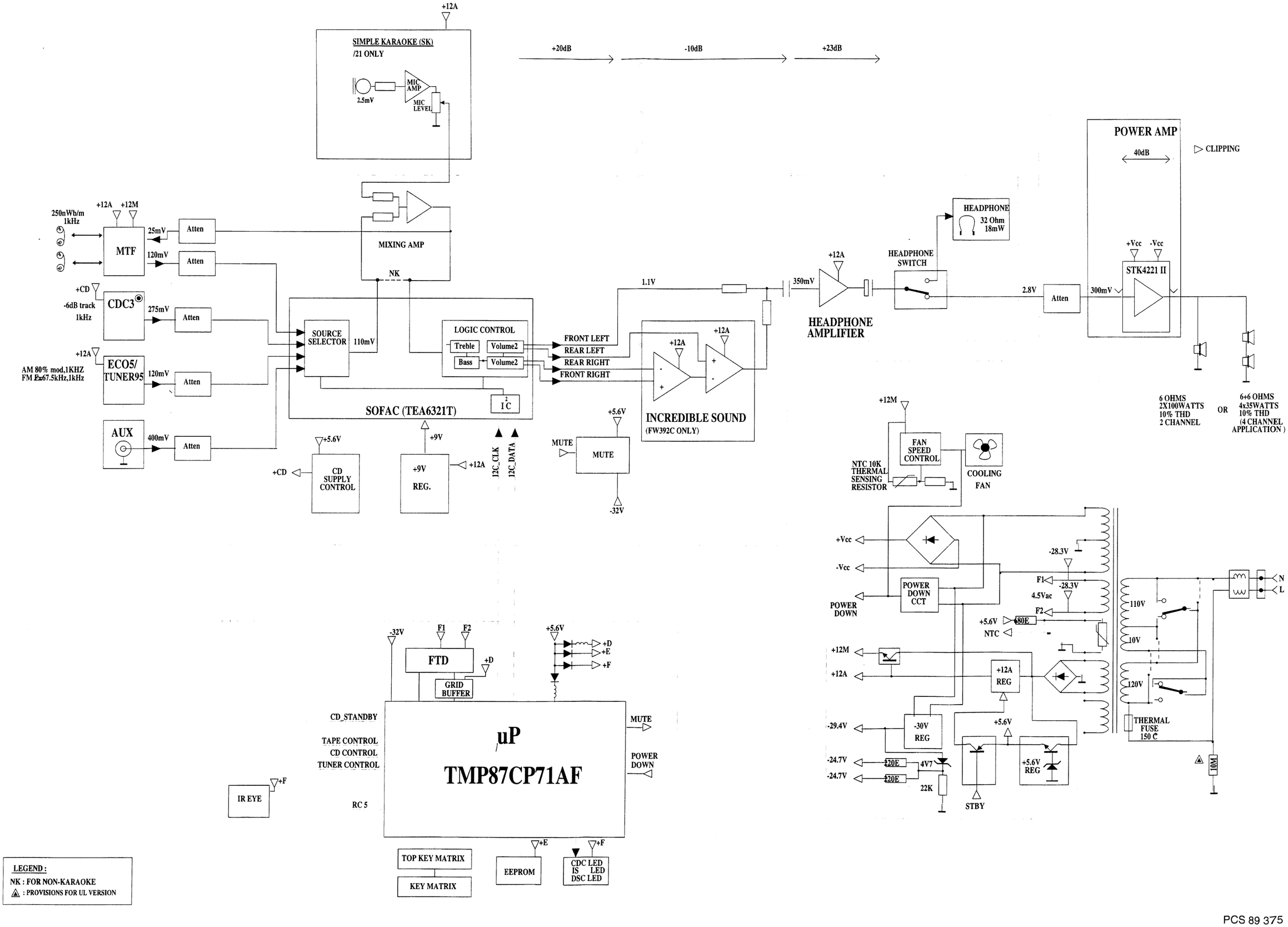
For FW315C/FW340C/FW345C/FW355C/FW365C

Key activated	Display	Key activated	Display	Key activated	Display
Stop/Clear	01	RDS Mode	13	Scroll Source	25
Program (CDC)	02	Clock Set	14	Incredible Stereo	26
Shuffle	03	Timer Set	15	Dbb	27
Search/Prev	04	Timer On/Off	16	Optimal	28
Play/Pause	05	Demo	17	Jazz	29
Search/Next	06	Volume Up	18	Rock	30
Disc 1	07	Volume Down	19	Pop	31
Disc 2	08	Tuning Down	20	Classic	32
Disc 3	09	Tuning Up	21	HSD	33
CD Open Close	10	Preset Down	22	any RC keys	RC
Program (TU)	11	Preset Up	23		
Band	12	Power/Standby	24		


To start service test program hold Program & Preset Up depressed while plugging in the mains cord
Display shows set version and number of ROM version "S yy xxxxxx" (Main menu)
1) S stands for Service Testprogram
yy stands for software version number of µP on Front Board (counted from 01 upwards)
xxxxxx model number
PLAY/PAUSE Button pressed?
N
Y
Motor Test
Display shows CD TEST
Disc Motor
Slide Motor
PROGRAM Button pressed?
SHUFFLE Button pressed?
NEXT Button pressed?
PREV Button pressed?
PLAY Button pressed?
Disc Motor turns CCW Display shows STOP
Disc Motor turns CW Display shows PLAY
Slide moves outside Display shows SLD 0
Slide moves inside Display shows SLD 1
Focus Servo Test
Display shows FOC x
FOC 0 = Focus not found
FOC 1 = Focus found
FOCUS found?
STOP Button pressed?
Display shows FOC 0
Display shows FOC 1
Disc Servo Test
Display shows DISC xxx
DISC SLW = too slow
DISC FST = too fast
DISC OK = speed correct
Radial Servo Test
Display shows RDL

4 - 1

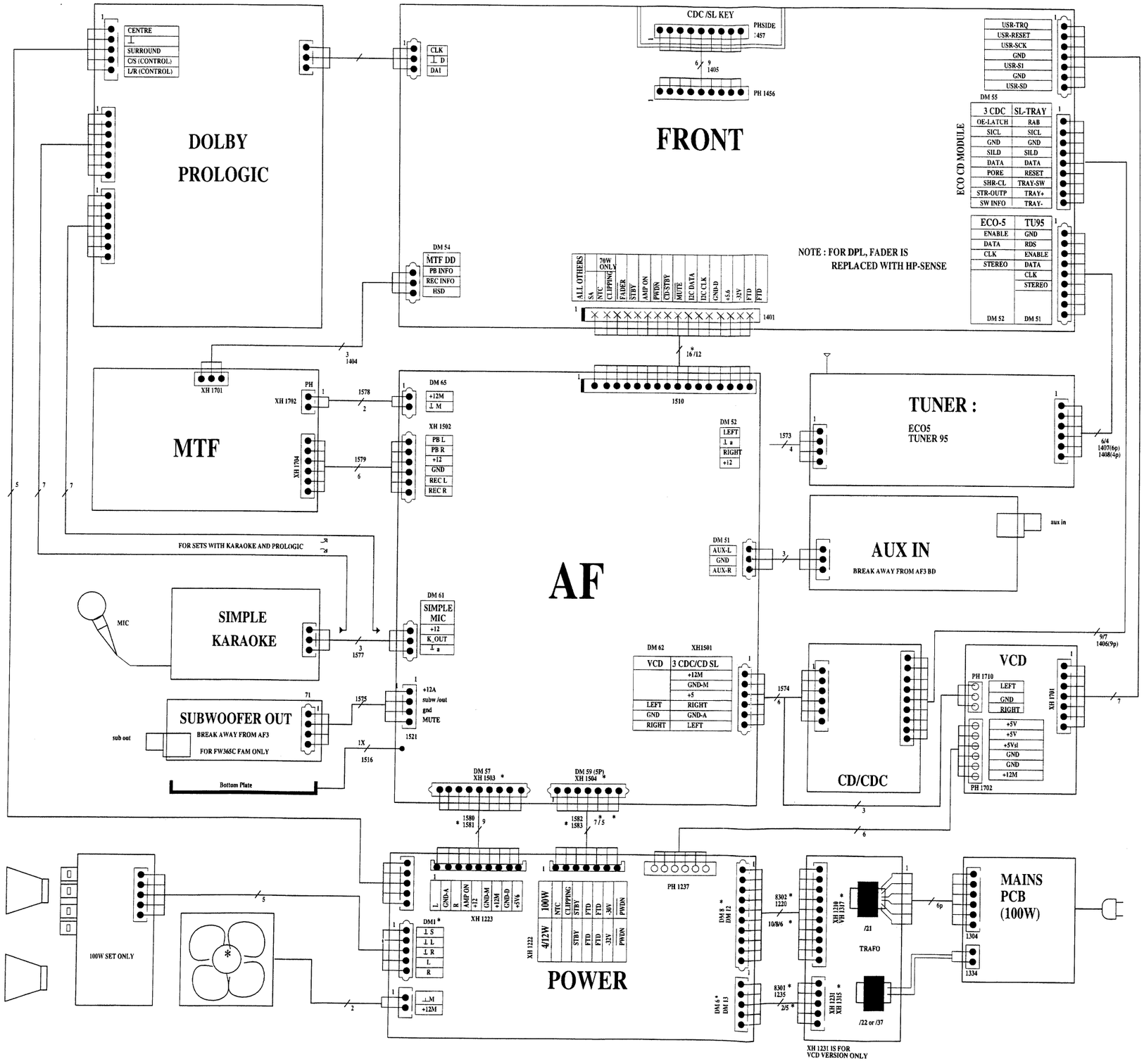
BLOCK DIAGRAM



LEGEND :
NK : FOR NON-KARAOKE
⚠ : PROVISIONS FOR UL VERSION

4-2

WIRING DIAGRAM



FRONT BOARD

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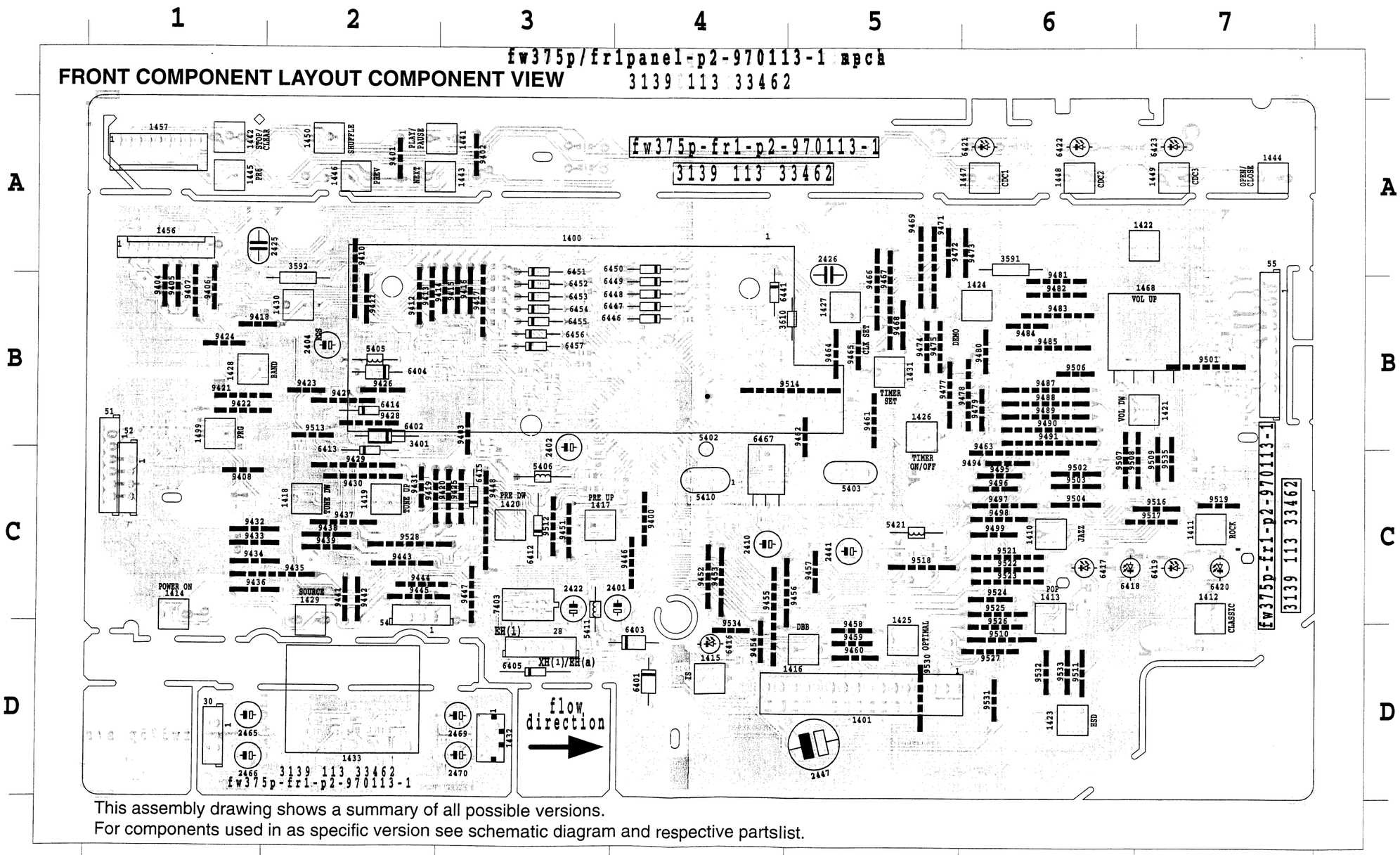
Component layout 6-1
Circuit diagram 6-2
Chip component layout 6-3
LCD pin connection 6-3
Electrical parts list 6-4

6-1

COMPONENT LAYOUT DIAGRAM

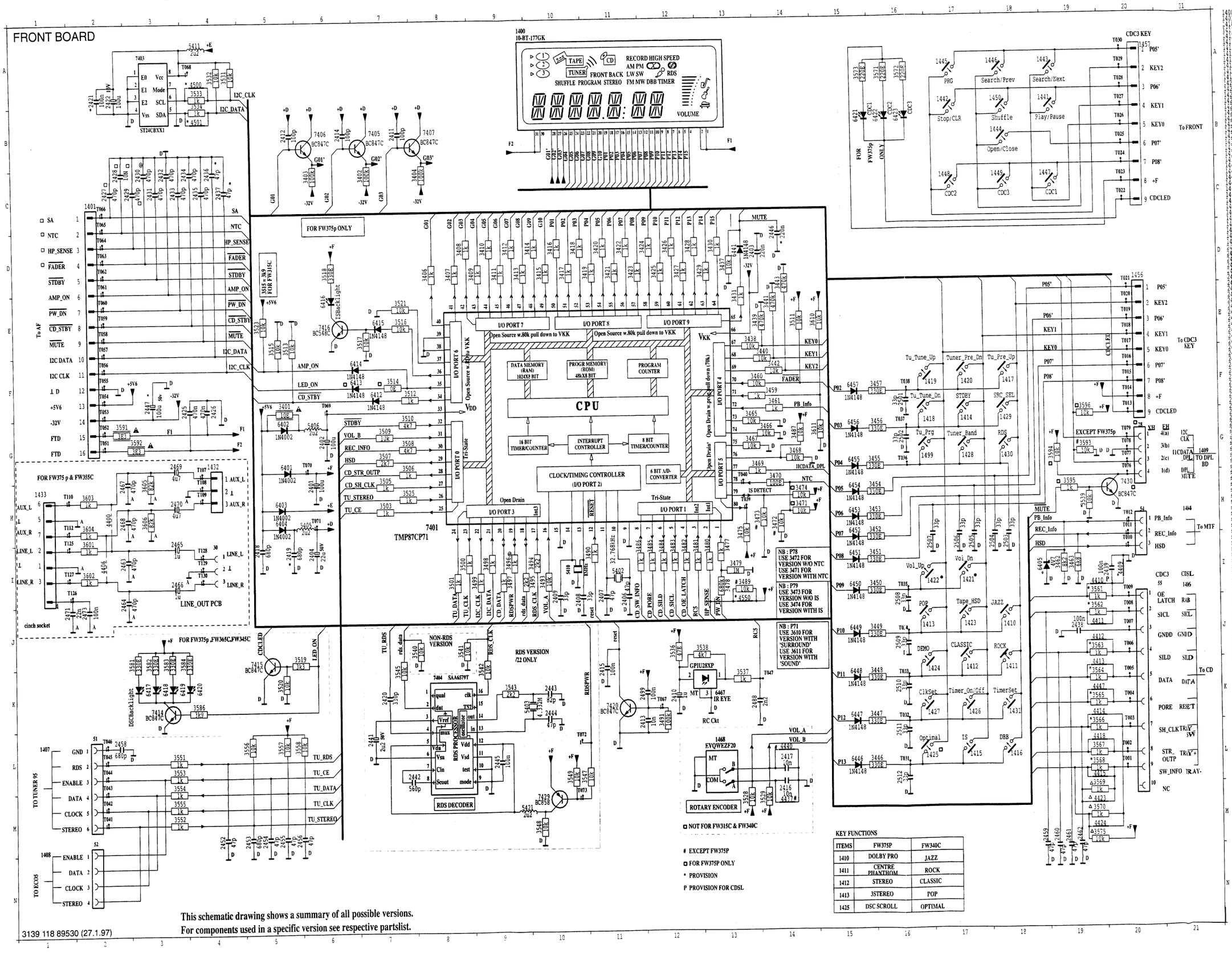
28 D 3	1414 C 1	1426 B 5	1445 A 1	2404 B 2	3591 A 6	6403 D 4	6421 A 6	6454 B 3	9406 B 1	9419 C 2	9431 C 2	9444 C 2	9458 D 5	9471 A 5	9484 B 6	9499 C 6	9513 B 2	9527 D 6
30 D 1	1415 D 4	1427 B 5	1446 A 2	2410 C 4	3592 B 2	6404 B 2	6422 A 6	6455 B 3	9407 B 1	9420 C 3	9432 C 1	9445 C 2	9459 D 5	9472 A 5	9485 B 6	9501 B 7	9514 B 5	9528 C 2
51 C 1	1416 D 5	1428 B 1	1447 A 6	2422 C 3	3610 B 5	6405 D 3	6423 A 7	6456 B 3	9408 C 1	9421 B 1	9433 C 1	9446 C 4	9460 D 5	9473 A 6	9487 B 6	9502 C 6	9516 C 7	9530 D 5
52 C 1	1417 C 3	1429 D 2	1448 A 6	2425 A 1	5402 C 4	6412 C 3	6441 B 4	6457 B 3	9410 B 2	9422 B 1	9434 C 1	9447 C 3	9461 B 5	9474 B 5	9488 B 6	9503 C 6	9517 C 7	9531 D 6
54 C 2	1418 C 2	1430 B 2	1449 A 7	2426 B 5	5403 C 5	6413 C 2	6446 B 4	6467 C 4	9411 B 2	9423 B 2	9435 C 2	9448 C 3	9462 B 5	9475 B 5	9489 B 6	9504 C 6	9518 C 5	9532 D 6
55 B 7	1419 C 2	1431 B 5	1450 A 2	2441 C 5	5405 B 2	6414 B 2	6447 B 4	7403 C 3	9412 B 2	9424 B 1	9436 C 1	9451 C 3	9463 C 6	9477 B 5	9490 B 6	9506 B 6	9519 C 7	9533 D 6
1400 A 3	1420 C 3	1432 D 3	1456 A 1	2447 D 5	5406 C 3	6415 C 3	6448 B 4	9400 C 4	9413 B 2	9425 C 3	9437 C 2	9452 C 4	9464 B 5	9478 B 6	9491 B 6	9507 C 6	9521 C 6	9534 D 4
1401 D 5	1421 B 7	1433 D 2	1457 A 1	2465 D 1	5410 C 4	6416 D 4	6449 B 4	9401 A 2	9414 B 3	9426 B 2	9438 C 2	9453 C 4	9465 B 5	9479 B 6	9494 C 6	9508 C 7	9522 C 6	9535 C 7
1410 C 6	1422 A 7	1441 A 3	1468 B 7	2466 D 1	5411 C 3	6417 C 6	6450 A 4	9402 A 3	9415 B 3	9427 B 2	9439 C 2	9454 D 4	9466 B 5	9480 B 6	9495 C 6	9509 C 7	9523 C 6	----
1411 C 7	1423 D 6	1442 A 1	1499 B 1	2469 D 3	5421 C 5	6418 C 6	6451 A 3	9403 B 3	9416 B 3	9428 B 2	9441 C 2	9455 C 4	9467 B 5	9481 B 6	9496 C 6	9510 D 6	9524 C 6	
1412 C 7	1424 B 6	1443 A 3	2401 C 4	2470 D 3	6401 D 4	6419 C 7	6452 B 3	9404 B 1	9417 B 3	9429 C 2	9442 C 2	9456 C 5	9468 B 5	9482 B 6	9497 C 6	9511 D 6	9525 C 6	
1413 C 6	1425 D 5	1444 A 7	2402 B 3	3401 B 2	6402 B 2	6420 C 7	6453 B 3	9405 B 1	9418 B 1	9430 C 2	9443 C 2	9457 C 5	9469 A 5	9483 B 6	9498 C 6	9512 C 3	9526 D 6	

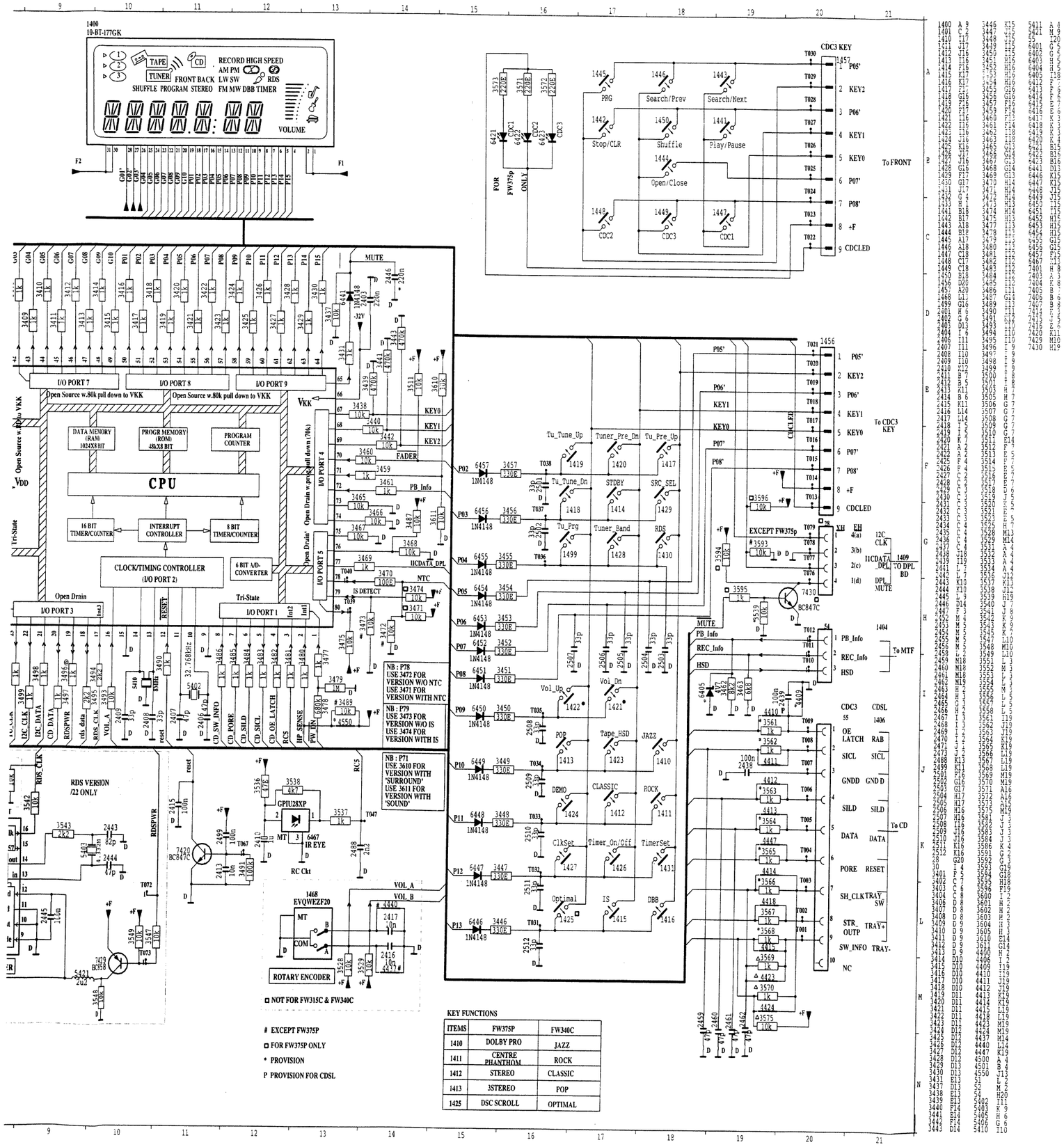


This assembly drawing shows a summary of all possible versions.
For components used in as specific version see schematic diagram and respective partslist.

6-2

FRONT BOARD



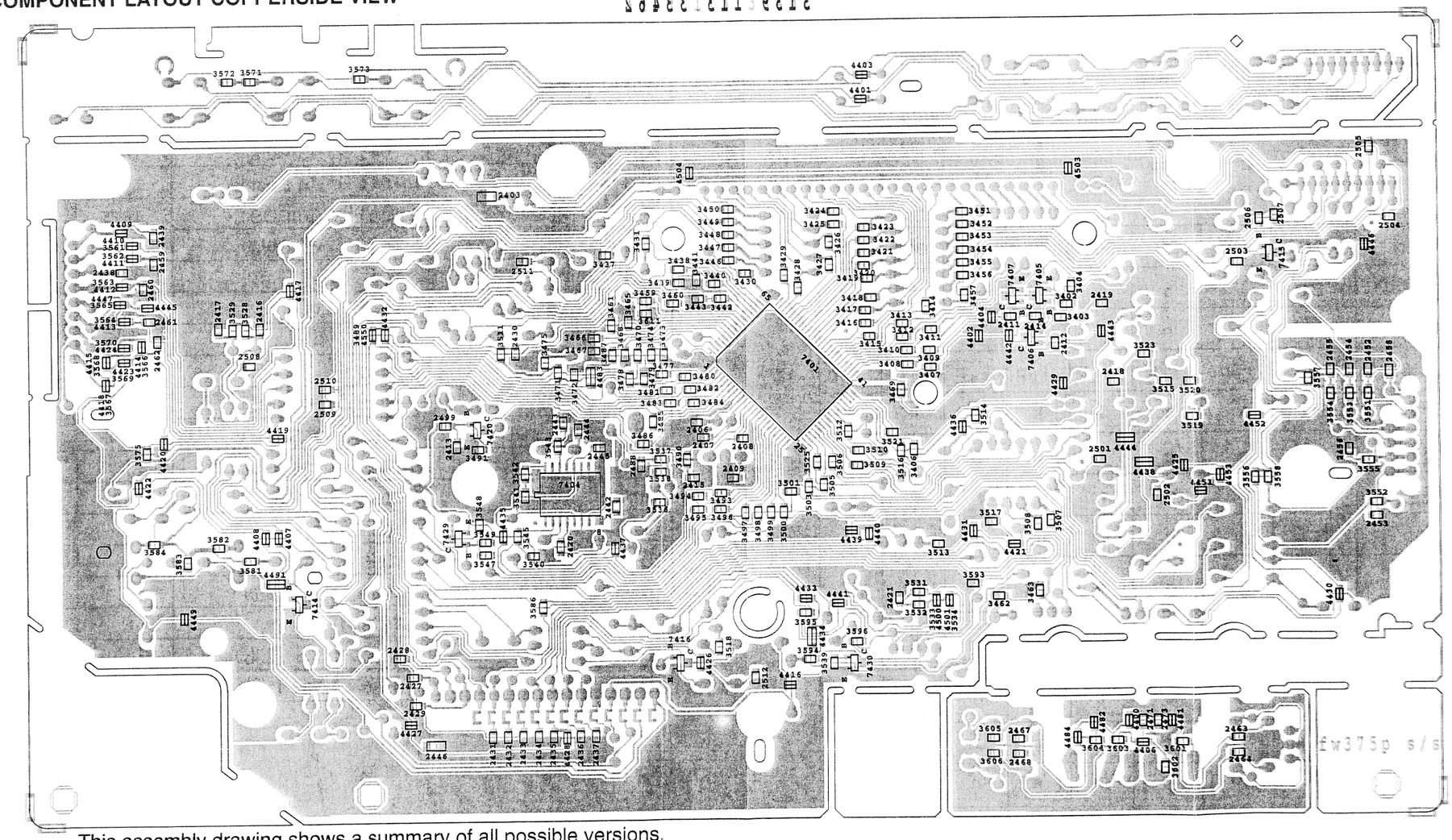


+5V6	F2,E5,F5
+D	B5-8,I5
+E	A4,H6
+F	D6,G6,L5,E14,H14,I13
	J14,J12,K11,M13,L10
	F19,M20,C21,F21
-32V	G2,C8,E13
_DPL	G21
12C_CLK	A4
12C_DATA	B4
AMP_ON	E2,E4
AUX_L	H1,G4
AUX_R	H1,H4
CD_STBY	E2,E4
CDLED	C21,G21
DATA	K21
DPL_MUTE	H21
F1	G2,B13
F2	G2,B9
FADER	D2,D4
GND D	J21
HP_SENSE	D2,D4
HSD	I21
I1CDATA	G21
I2C CLK	F2,F4,G21
I2C DATA	F2,F4
KEY0	B21,F21
KEY1	B21,E21
KEY2	A21,E21
LINE_L	I1,I4
LINE_R	I1,I4
MUTE	E2,E4
NC	M21
NTC	D2,D4
OE LATCH	J21
P05'	A21,E21
P06'	A21,E21
P07'	B21,F21
P08'	C21,F21
PB_Info	H21
PORE	K21
PW_DN	E2,E4
RAB	J21
REC_Info	I21
RESET	K21
SA	C2,C4
SH_CLK	L21
SILD	J21
STDYBY	D2,D4
STR_OUTP	L21
TRAY+	L21
TRAY-	L21
TRAY_SW	L2

6-3

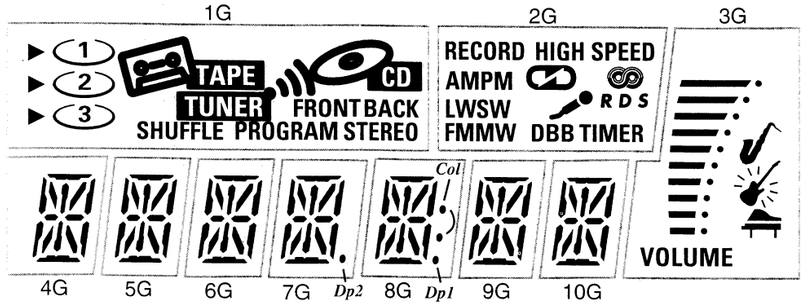
2403 A 5	2427 D 6	2445 C 5	2471 D 2	3402 B 2	3419 B 3	3440 B 4	3459 B 4	3477 B 4	3495 C 4	3513 C 3	3534 C 3	3554 B 1	3572 A 6	3605 D 3	4414 B 7	4430 C 1	4446 B 1	7401 B 4
2406 C 4	2428 D 6	2446 D 5	2473 D 2	3403 B 2	3420 B 3	3441 B 4	3460 B 4	3478 B 5	3496 C 4	3514 B 3	3536 C 4	3555 C 1	3573 A 6	3606 D 3	4415 B 7	4431 C 3	4447 B 7	7404 C 5
2407 C 4	2429 D 6	2452 B 1	2488 C 4	3404 B 2	3421 B 3	3442 B 4	3461 B 5	3479 B 4	3497 C 4	3515 B 2	3537 C 4	3556 C 1	3575 C 7	3611 B 4	4416 D 4	4432 B 6	4449 C 7	7405 B 2
2408 C 4	2430 B 5	2453 C 1	2499 C 5	3406 C 3	3422 B 3	3443 B 4	3462 C 3	3480 B 4	3498 C 4	3516 C 3	3538 C 4	3557 B 1	3581 C 6	4400 D 2	4417 B 6	4433 C 4	4451 C 2	7406 B 2
2409 C 4	2431 D 5	2454 B 1	2501 C 2	3407 B 3	3423 B 3	3446 B 4	3463 C 2	3481 B 4	3499 C 4	3517 C 3	3539 D 3	3558 C 1	3582 C 7	4401 A 3	4418 B 7	4434 D 4	4452 C 1	7407 B 3
2411 B 3	2432 D 5	2455 B 1	2502 C 2	3408 B 3	3424 A 3	3447 B 4	3465 B 5	3482 B 4	3500 C 4	3518 D 4	3540 C 5	3561 B 7	3583 C 7	4402 B 3	4419 C 6	4435 C 5	4453 C 2	7414 C 6
2412 B 2	2433 D 5	2456 C 1	2503 B 1	3409 B 3	3425 B 3	3448 B 4	3466 B 5	3483 B 4	3501 C 4	3519 C 2	3541 C 5	3562 B 7	3584 C 7	4403 A 3	4420 C 7	4436 C 3	4481 D 2	7415 B 1
2413 C 5	2434 D 5	2458 B 1	2504 B 1	3410 B 3	3426 B 4	3449 A 4	3467 B 5	3484 B 4	3503 C 4	3520 B 2	3542 C 5	3563 B 7	3586 C 5	4404 B 3	4421 C 3	4437 C 5	4482 D 2	7416 D 4
2414 B 2	2435 D 5	2459 B 7	2505 A 1	3411 B 3	3427 B 4	3450 A 4	3468 B 5	3485 C 4	3505 C 4	3521 C 3	3543 C 5	3564 B 7	3593 C 3	4406 D 2	4422 C 7	4438 C 2	4483 B 5	7420 C 5
2415 C 4	2436 D 5	2460 B 7	2506 B 1	3412 B 3	3428 B 4	3451 A 3	3469 B 3	3486 C 4	3506 C 3	3523 B 2	3545 C 5	3565 B 7	3594 D 4	4407 C 6	4423 B 7	4439 C 3	4484 D 2	7429 C 5
2416 B 6	2437 D 5	2461 B 7	2507 A 1	3413 B 3	3429 B 4	3452 B 3	3470 B 4	3487 B 5	3507 C 2	3525 C 4	3547 C 5	3566 B 7	3595 C 4	4408 C 6	4424 B 7	4440 C 3	4491 C 6	7430 D 3
2417 B 7	2438 B 7	2462 B 7	2508 B 6	3414 B 3	3430 B 4	3453 B 3	3471 B 5	3489 B 6	3508 C 2	3528 B 6	3548 C 5	3567 B 7	3596 D 3	4409 B 7	4425 C 2	4441 C 3	4500 C 3	----
2418 B 2	2439 B 7	2463 D 1	2509 B 6	3415 B 3	3431 B 4	3454 B 3	3472 B 5	3490 C 4	3509 C 3	3529 B 6	3549 C 5	3568 B 7	3601 D 2	4410 B 7	4426 D 4	4442 B 3	4501 C 3	
2419 B 2	2442 C 5	2464 D 1	2510 B 6	3416 B 3	3437 B 5	3455 B 3	3473 B 4	3491 C 5	3510 C 3	3531 C 3	3551 B 1	3569 B 7	3602 D 2	4411 B 7	4427 D 6	4443 B 2	4503 A 2	
2420 C 5	2443 C 5	2467 D 3	2511 B 5	3417 B 3	3438 B 4	3456 B 3	3474 B 4	3493 C 4	3511 B 5	3532 C 3	3552 C 1	3570 B 7	3603 D 2	4412 B 7	4428 D 5	4444 C 2	4504 A 4	
2421 C 3	2444 C 5	2468 D 3	2512 D 4	3418 B 3	3439 B 4	3457 B 3	3475 B 5	3494 C 4	3512 C 3	3533 C 3	3553 B 1	3571 A 6	3604 D 2	4413 B 7	4429 B 2	4445 B 7	4550 B 6	

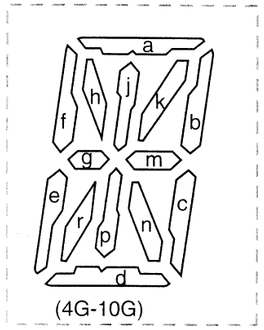
COMPONENT LAYOUT COPPERSIDE VIEW

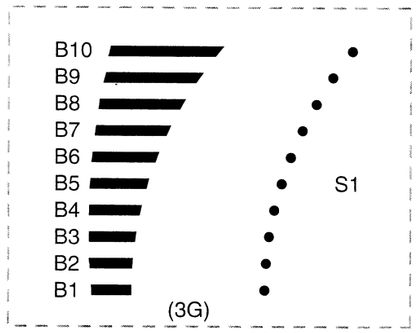


This assembly drawing shows a summary of all possible versions.
For components used in as specific version see schematic diagram and respective partslist.

LCD PIN CONNECTION







	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1	▶ (1)	RECORD	B1	a	a	a	a	a	a	a
P2	▶ (2)	HIGH SPEED	B2	h	h	h	h	h	h	h
P3	▶ (3)	AM	B3	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	1 2 3	PM	B4	k	k	k	k	k	k	k
P5	(1)	RDS	B5	b	b	b	b	b	b	b
P6	(2)	⇄	B6	f	f	f	f	f	f	f
P7	(3)	(	B7	m	m	m	m	m	m	m
P8	TAPE	)	B8	g	g	g	g	g	g	g
P9	TUNER		B9	c	c	c	c	c	c	c
P10	CD	LW	B10	e	e	e	e	e	e	e
P11	FRONT	SW	VOLUME	r	r	r	r	r	r	r
P12	BACK	FM		n	n	n	n	n	n	n
P13	SHUFFLE	MW		d	d	d	d	d	d	d
P14	PROGRAM	DBB		-	-	-	*Dp2*	*Dp1*	-	-
P15	STEREO	TIMER		-	-	-	-	*col*	-	-

6-4

MICROPROCESSOR PIN DESCRIPTION

T001	Cd Sw Info	T031	P13	T061	Amp_On
T002	Cd Str Output	T032	P12	T062	Stdby
T003	Cd Sh Clk	T033	P11	T063	-
T004	Cd Pore	T034	P10	T064	Hp Sen
T005	Cd Data	T035	P035	T065	-
T006	Cd Sild	T036	P04	T066	*NTC*
T007	GND D	T037	P03	T067	-
T008	Cd Sicl	T038	P02	T068	E2prom Sup
T009	Cd OE Latch	T039	-	T069	Vdd
T010	HSD	T040	*NTC*	T070	+F
T011	Rec_Info	T041	Tu Stereo	T071	+D
T012	Pb_Info	T042	Tu Clk	T072	-
T013	Cdcled	T043	Tu Data	T073	-
T014	+F	T044	Tu Enable	T074	-
T015	P08'	T045	Tu RDS	T075	-
T016	P07'	T046	Tu GND	T076	Mute
T017	KEY 0	T047	-	T077	I2C Data
T018	KEY 1	T048	-	T078	GND
T019	P06'	T049	-	T079	I2C Clk
T020	KEY 2	T050	-		
T021	P05'	T051	FTD (F2)		
T022	Cdcled	T052	FTD (F1)		
T023	+F	T053	-32V		
T024	P08'	T054	+5V6		
T025	P07'	T055	+D		
T026	KEY 0	T056	I2C Clk		
T027	KEY 1	T057	I2C Data		
T028	P06'	T058	Mute		
T029	KEY 2	T059	Cd_Stdby		
T030	P05'	T060	Pw_Dn		

ELECTRICAL PARTSLIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00014	Fluorescent Display
1410	4822 276 13114	Tact Switch
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1417	4822 276 13114	Tact Switch
1418	4822 276 13114	Tact Switch
1419	4822 276 13114	Tact Switch
1420	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1424	4822 276 13114	Tact Switch
1425	4822 276 13114	Tact Switch
1426	4822 276 13114	Tact Switch
1427	4822 276 13114	Tact Switch
1428	4822 276 13114	Tact Switch
1429	4822 276 13114	Tact Switch
1431	4822 276 13114	Tact Switch
1441	4822 276 13114	Tact Switch
1442	4822 276 13114	Tact Switch
1443	4822 276 13114	Tact Switch
1444	4822 276 13114	Tact Switch
1445	4822 276 13114	Tact Switch
1446	4822 276 13114	Tact Switch
1450	4822 276 13114	Tact Switch
1468	4822 101 90254	Switch
1499	4822 276 13114	Tact Switch

CAPACITORS

2401	4822 124 41584	100µF 20% 10V
2402	4822 124 42446	100µF 20% 10V
2403	4822 122 33496	100nF 10%X7R 63V
2404	4822 124 41596	22µF 20% 50V
2406	5322 122 32481	15pF 5% 50V
2407	5322 122 32481	15pF 5% 50V
2408	5322 122 32659	33pF 5% 50V
2409	5322 122 33514	68pF 5% 50V
2410	4822 124 40242	1µF 20% 63V
2411	5322 122 32531	100pF 5% NP0 50V
2412	5322 122 32531	100pF 5% NP0 50V
2413	4822 122 33177	10nF 20% X7R 50V
2414	5322 122 32531	100pF 5% NP0 50V
2415	4822 126 13838	100nF Y5V 0805 50V P
2416	4822 122 33177	10nF 20% X7R 50V
2417	4822 122 33177	10nF 20% X7R 50V
2418	5322 122 34099	470pF 10% 63V -/21/34
2419	5322 122 34099	470pF 10% 63V -/21/34
2422	4822 124 41584	100µF 20% 10V
2425	4822 121 51252	470nF 5% 63V
2426	4822 121 51252	470nF 5% 63V
2428	4822 122 33177	10nF 20% X7R 50V
2429	5322 122 34099	470pF 10% X7R 63V
2431	5322 122 34099	470pF 10% X7R 63V
2432	5322 122 34099	470pF 10% X7R 63V
2433	5322 122 34099	470pF 10% X7R 63V
2434	5322 122 34099	470pF 10% X7R 63V
2435	5322 122 34099	470pF 10% X7R 63V
2436	5322 122 32452	47pF 5% NPO 63V
2437	5322 122 32452	47pF 5% NPO 63V
2438	4822 126 13838	100nF Y5V 0805 50V
2439	4822 126 13838	100nF Y5V 0805 50V
2441	4822 124 41576	2.2µF 20% 50V -/22/25
2442	5322 116 80853	560pF 5% NP0 63V -/22/25
2443	4822 122 33515	82pF 5% NP0 63V -/22/25
2444	5322 122 32452	47pF 5% NP0 63V -/22/25
2447		100µF 20% 63V -/21/34
2452	5322 122 32452	47pF 5% NP0 63V -/22/25
2453	5322 122 32452	47pF 5% NP0 63V
2454	5322 122 32452	47pF 5% NP0 63V
2455	5322 122 32452	47pF 5% NP0 63V
2456	5322 122 32452	47pF 5% NP0 63V
2458	5322 126 10184	680pF 5% NP0 63V -/22/25
2459	5322 122 32452	47pF 5% NP0 63V
2460	5322 122 32452	47pF 5% NP0 63V
2461	5322 122 32452	47pF 5% NP0 63V
2462	5322 122 32452	47pF 5% NP0 63V
2488	4822 122 33175	2,2nF 20% X7R 50V
2499	4822 126 13838	100nF Y5V 0805 50V
2501	5322 122 32659	33pF 5% NP0 63V
2502	5322 122 32659	33pF 5% NP0 63V
2503	5322 122 32659	33pF 5% NP0 63V
2504	5322 122 32659	33pF 5% NP0 63V
2505	5322 122 32659	33pF 5% NP0 63V
2506	5322 122 32659	33pF 5% NP0 63V
2507	5322 122 32659	33pF 5% NP0 63V
2508	5322 122 32659	33pF 5% NP0 63V
2509	5322 122 32659	33pF 5% NP0 63V
2510	5322 122 32659	33pF 5% NP0 63V
2511	5322 122 32659	33pF 5% NP0 63V
2512	5322 122 32659	33pF 5% NP0 63V

RESISTORS

3402	4822 051 20104	100K 5% 0,1W
3403	4822 051 20104	100K 5% 0,1W
3404	4822 051 20104	100K 5% 0,1W
3406	4822 051 10102	1K 2% 0,25W
3407	4822 051 10102	1K 2% 0,25W
3408	4822 051 10102	1K 2% 0,25W
3409	4822 051 10102	1K 2% 0,25W
3410	4822 051 10102	1K 2% 0,25W
3411	4822 051 10102	1K 2% 0,25W
3412	4822 051 10102	1K 2% 0,25W
3413	4822 051 10102	1K 2% 0,25W
3414	4822 051 10102	1K 2% 0,25W
3415	4822 051 10102	1K 2% 0,25W
3416	4822 051 10102	1K 2% 0,25W
3417	4822 051 10102	1K 2% 0,25W
3418	4822 051 10102	1K 2% 0,25W
3419	4822 051 10102	1K 2% 0,25W
3420	4822 051 10102	1K 2% 0,25W

ELECTRICAL PARTSLIST - FRONT BOARD

3421	4822 051 10102	1K 2% 0,25W
3422	4822 051 10102	1K 2% 0,25W
3423	4822 051 10102	1K 2% 0,25W
3424	4822 051 10102	1K 2% 0,25W
3425	4822 051 10102	1K 2% 0,25W
3426	4822 051 10102	1K 2% 0,25W
3427	4822 051 10102	1K 2% 0,25W
3428	4822 051 10102	1K 2% 0,25W
3429	4822 051 10102	1K 2% 0,25W
3430	4822 051 10102	1K 2% 0,25W
3431	4822 051 10102	1K 2% 0,25W
3437	4822 117 10833	10K 10% 0,1W
3438	4822 117 10833	10K 10% 0,1W
3439	4822 051 20474	470K 5% 0,1W
3440	4822 117 10833	10K 10% 0,1W
3441	4822 051 20474	470K 5% 0,1W
3442	4822 117 10833	10K 10% 0,1W
3443	4822 051 20474	470K 5% 0,1W
3446	4822 051 20331	330R 5% 0,1W
3447	4822 051 20331	330R 5% 0,1W
3448	4822 051 20331	330R 5% 0,1W
3449	4822 051 20331	330R 5% 0,1W
3450	4822 051 20331	330R 5% 0,1W
3451	4822 051 20331	330R 5% 0,1W
3452	4822 051 20331	330R 5% 0,1W
3453	4822 051 20331	330R 5% 0,1W
3454	4822 051 20331	330R 5% 0,1W
3455	4822 051 20331	330R 5% 0,1W
3456	4822 051 20331	330R 5% 0,1W
3457	4822 051 20331	330R 5% 0,1W
3459	4822 051 10102	1K 2% 0,25W
3460	4822 117 10833	10K 10% 0,1W
3461	4822 051 10102	1K 2% 0,25W
3462	4822 051 20822	8K2 5% 0,1W
3463	4822 051 20682	6K8 5% 0,1W
3465	4822 117 10833	10K 10% 0,1W
3466	4822 117 10833	10K 10% 0,1W
3467	4822 117 10833	10K 10% 0,1W
3468	4822 117 10833	10K 10% 0,1W
3469	4822 051 10102	1K 2% 0,25W
3470	4822 051 20101	100R 5% 0,1W
3472	4822 117 10833	10k 1% 0.1W
3474	4822 117 10833	10k 10% 0,1W
3475	4822 117 10833	10K 10% 0,1W
3477	4822 051 10102	1K 2% 0,25W
3478	4822 051 20684	680K 5% 0,1W
3479	4822 051 20105	1M 5% 0,1W
3480	4822 051 10102	1K 2% 0,25W
3481	4822 051 10102	1K 2% 0,25W
3482	4822 051 10102	1K 2% 0,25W
3483	4822 051 10102	1K 2% 0,25W
3484	4822 051 10102	1K 2% 0,25W
3485	4822 051 10102	1K 2% 0,25W
3486	4822 051 10102	1K 2% 0,25W
3489	4822 117 10833	10k 1% 0.1W
3490	4822 051 10102	1K 2% 0,25W
3491	4822 051 20104	100K 5% 0,1W
3493	4822 117 10833	10K 10% 0,1W
3494	4822 117 11449	2K2 1% 0,1W
3495	4822 117 11449	2K2 1% 0,1W
3496	4822 051 10102	1K 2% 0,25W -/22/25
3497	4822 051 10102	1K 2% 0,25W
3498	4822 051 10102	1K 2% 0,25W
3499	4822 051 10102	1K 2% 0,25W
3500	4822 051 10102	1K 2% 0,25W
3501	4822 051 10102	1K 2% 0,25W
3503	4822 051 10102	1K 2% 0,25W
3505	4822 051 10102	1K 2% 0,25W
3506	4822 051 10102	1K 2% 0,25W
3507	4822 051 20272	2K7 5% 0,1W
3508	4822 051 20472	4K7 5% 0,1W
3509	4822 117 10833	10K 10% 0,1W
3510	4822 051 10102	1K 2% 0,25W
3511	4822 117 10833	10K 10% 0,1W
3512	4822 051 10102	1K 2% 0,25W
3513	4822 117 10833	10K 10% 0,1W
3514	4822 051 20008	Jumper
3516	4822 117 10833	10K 10% 0,1W
3517	4822 117 10833	10K 10% 0,1W
3518	4822 051 20331	330R 5% 0,1W
3521	4822 117 10833	10K 10% 0,1W
3525	4822 051 10102	1K 2% 0,25W
3528	4822 117 10833	10k 10% 0,1W
3529	4822 117 10833	10k 10% 0,1W
3531	4822 117 10833	10K 10% 0,1W
3532	4822 117 10833	10K 10% 0,1W
3533	4822 051 10102	1K 2% 0,25W
3534	4822 051 10102	1K 2% 0,25W
3536	4822 051 20479	47R 5% 0,1W
3537	4822 051 10102	1K 2% 0,25W
3538	4822 051 20472	4K7 5% 0,1W -/21
3540	4822 117 10833	10K 10% 0,1W -/21
3541	4822 117 10833	10K 10% 0,1W -/21
3542	4822 117 10833	10K 10% 0,1W -/22/25
3543	4822 117 11449	2K2 1% 0.1W -/22/25
3545	4822 117 10833	10K 10% 0,1W -/22/25
3547	4822 117 10833	10K 10% 0,1W -/22/25
3548	4822 117 10833	10K 10% 0,1W -/22/25
3549	4822 117 10833	10K 10% 0,1W -/22/25
3551	4822 117 10833	10K 10% 0,1W -/22/25
3552	4822 051 10102	1K 2% 0,25W
3553	4822 051 10102	1K 2% 0,25W
3554	4822 051 10102	1K 2% 0,25W
3555	4822 051 10102	1K 2% 0,25W
3556	4822 117 10833	10K 10% 0,1W
3557	4822 117 10833	10K 10% 0,1W
3558	4822 117 10833	10K 10% 0,1W
3575	4822 117 10833	10K 10% 0,1W
3581	4822 051 20331	330R 5% 0,1W
3582	4822 051 20331	330R 5% 0,1W

ELECTRICAL PARTSLIST - FRONT BOARD

RESISTORS

3583	4822 051 20331	330R 5% 0,1W
3584	4822 051 20331	330R 5% 0,1W
3586	4822 051 20392	3k9 5% 0,1W
3591	4822 052 10108	1R 5% 0,33W
3592	4822 052 10108	1R 5% 0,33W
3593	4822 117 10833	10K 10% 0,1W
3611	4822 117 10833	10K 10% 0,1W

JUMPERS

4401	4822 051 20008	JUMPER OR
4402	4822 051 20008	JUMPER OR -/21
4403	4822 051 20008	JUMPER OR
4404	4822 051 20008	JUMPER OR -/21
4407	4822 051 20008	JUMPER OR
4408	4822 051 20008	JUMPER OR
4410	4822 051 20008	JUMPER OR
4411	4822 051 20008	JUMPER OR
4412	4822 051 20008	JUMPER OR
4413	4822 051 20008	JUMPER OR
4416	4822 051 20008	JUMPER OR
4417	4822 051 20008	JUMPER OR
4418	4822 051 20008	JUMPER OR
4419	4822 051 20008	JUMPER OR
4420	4822 051 20008	JUMPER OR
4421	4822 051 20008	JUMPER OR
4422	4822 051 20008	JUMPER OR
4423	4822 051 20008	JUMPER OR
4424	4822 051 20008	JUMPER OR
4425	4822 051 20008	JUMPER OR
4426	4822 051 20008	JUMPER OR
4427	4822 051 20008	JUMPER OR
4428	4822 051 20008	JUMPER OR
4429	4822 051 20008	JUMPER OR
4430	4822 051 20008	JUMPER OR
4431	4822 051 20008	JUMPER OR
4432	4822 051 20008	JUMPER OR
4433	4822 051 20008	JUMPER OR
4434	4822 051 10008	JUMPER OR
4435	4822 051 20008	JUMPER OR
4436	4822 051 20008	JUMPER OR
4438	4822 051 10008	JUMPER OR -/21
4439	4822 051 20008	JUMPER OR
4441	4822 051 20008	JUMPER OR
4442	4822 051 20008	JUMPER OR
4443	4822 051 20008	JUMPER OR
4444	4822 051 10008	JUMPER OR -/21
4445	4822 051 20008	JUMPER OR
4446	4822 051 20008	JUMPER OR
4447	4822 051 20008	JUMPER OR
4449	4822 051 20008	JUMPER OR
4451	4822 051 20008	JUMPER OR
4452	4822 051 20008	JUMPER OR
4453	4822 051 20008	JUMPER OR
4483	4822 051 10008	JUMPER OR -/21
4491	4822 051 20008	JUMPER OR
4503	4822 051 20008	JUMPER OR -/21
4504	4822 051 20008	JUMPER OR -/21

ELECTRICAL PARTSLIST - FRONT BOARD

COILS & INDUCTORS

5402	4822 242 70938	TA252E00 (32,768KHz)
5403	4822 242 72195	CRYSTAL -/22/25
5405	4822 156 21721	INDUCTOR 2,2µH 10%
5406	4822 156 21721	INDUCTOR 2,2µH 10%
5410	4822 242 72066	CERAMIC FILTER 8MHz
5411	4822 156 21721	INDUCTOR 2,2µH 10%
5421	4822 156 21721	INDUCTOR 2,2µH 10%

DIODES

6401	5322 130 30684	1N4002
6402	5322 130 30684	1N4002
6403	5322 130 30684	1N4002
6404	5322 130 30684	1N4002
6405	4822 130 34174	BZX79-B4V7
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 10791	LED
6417	4822 130 10791	LED
6418	4822 130 10791	LED
6419	4822 130 10791	LED
6420	4822 130 10791	LED
6441	4822 130 30621	1N4148
6446	4822 130 30621	1N4148
6447	4822 130 30621	1N4148
6448	4822 130 30621	1N4148
6449	4822 130 30621	1N4148
6450	4822 130 30621	1N4148
6451	4822 130 30621	1N4148
6452	4822 130 30621	1N4148
6453	4822 130 30621	1N4148
6454	4822 130 30621	1N4148
6455	4822 130 30621	1N4148
6456	4822 130 30621	1N4148
6457	4822 130 30621	1N4148
6467	4822 130 10165	GP1U28XP

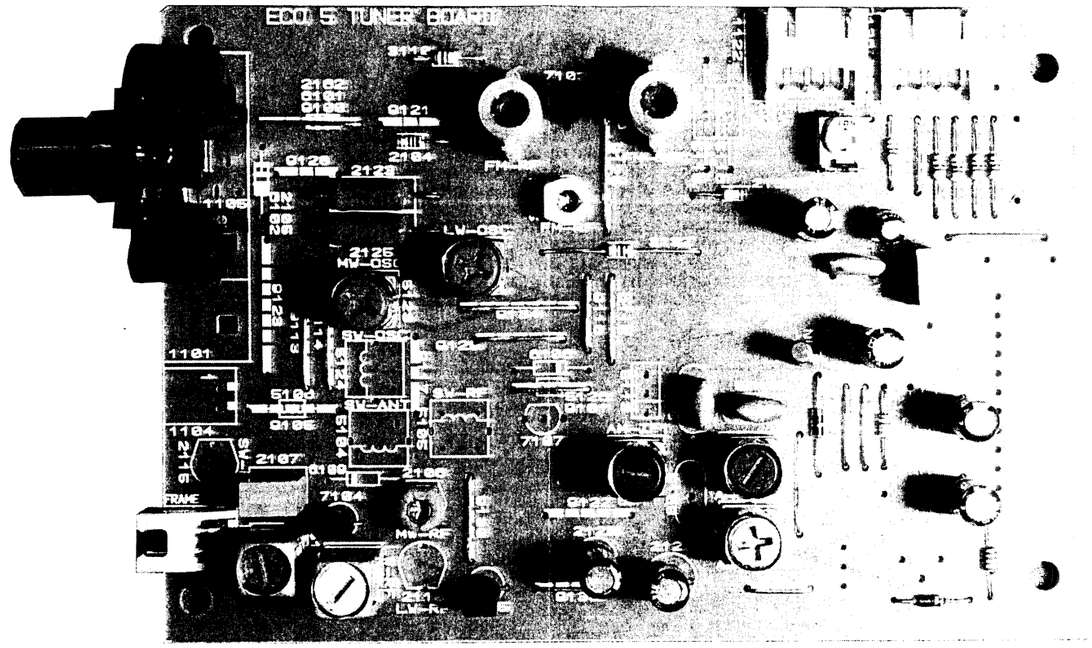
INTERGRATED CIRCUITS

7401	4822 209 15397	TMP87CP71F-332S51361
7403	4822 209 31508	ST24C01B6

TRANSISTORS

7404	5322 130 42755	BC847C
7405	5322 130 42755	BC847C
7406	5322 130 42755	BC847C
7407	5322 130 42755	BC847C
7414	5322 130 42755	BC847C
7416	5322 130 42755	BC847C
7420	5322 130 42755	BC847C
7429	4822 130 42513	BC858C

Note : Only the parts mentioned in this list are normal service spare parts.



TUNER BOARD ECO5

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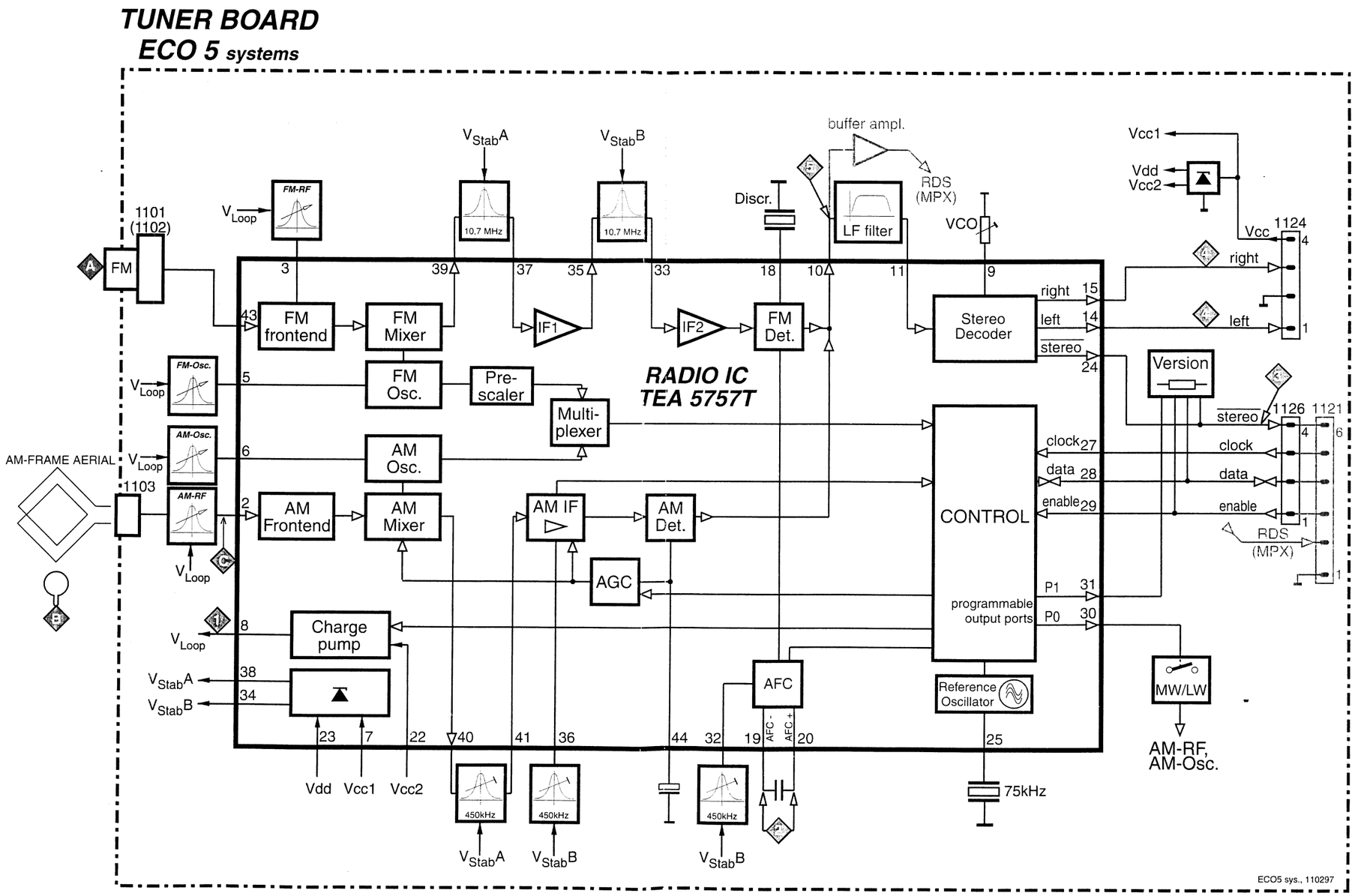
BLOCKDIAGRAM



TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check	1	1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 26 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV	IC 7101 36 — 100nF — 220R	5111	4	max. f_o symmetric
			IC 7101 40 — 100nF — 220R see remark [2]	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	4	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, 170996

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

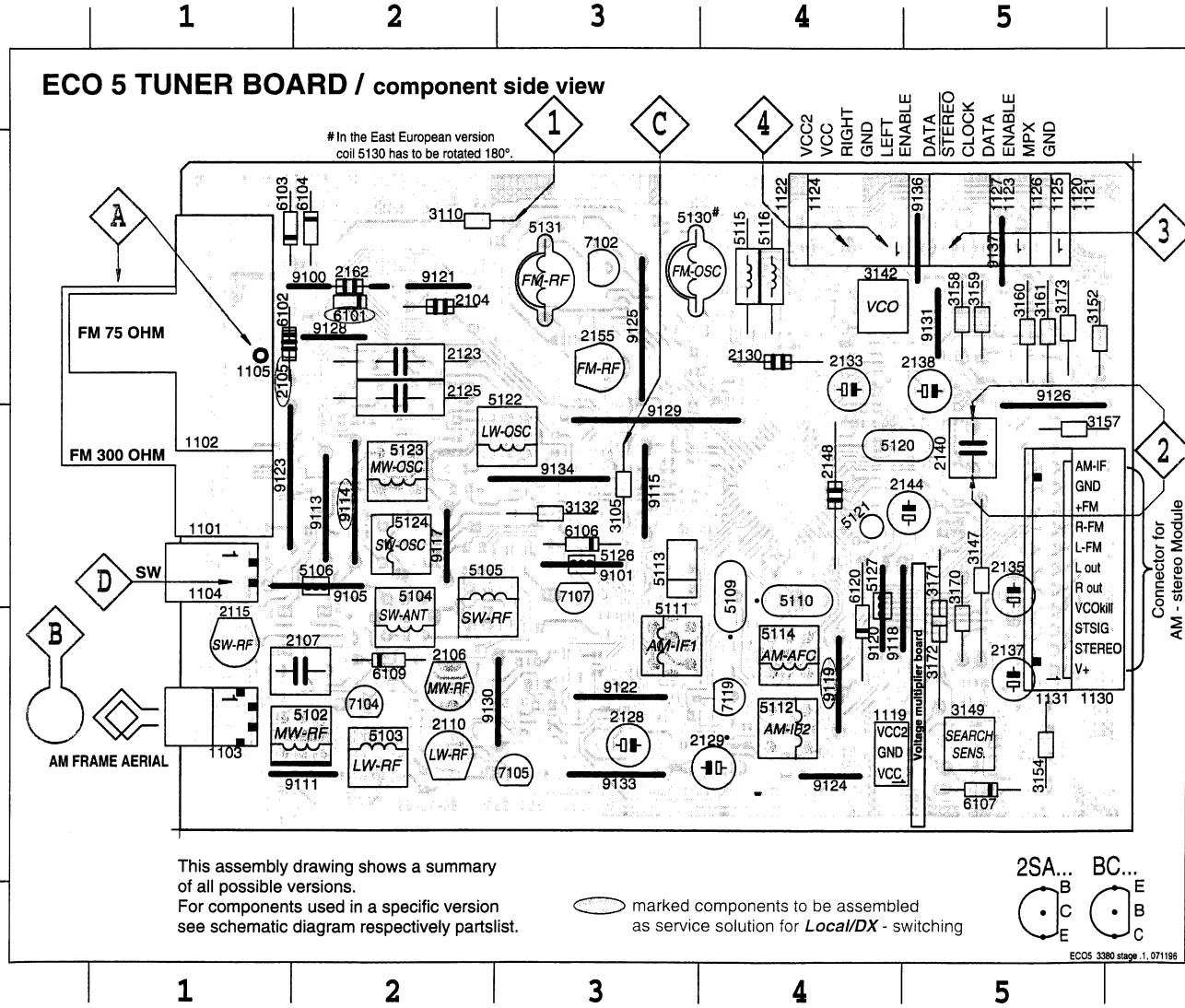
2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

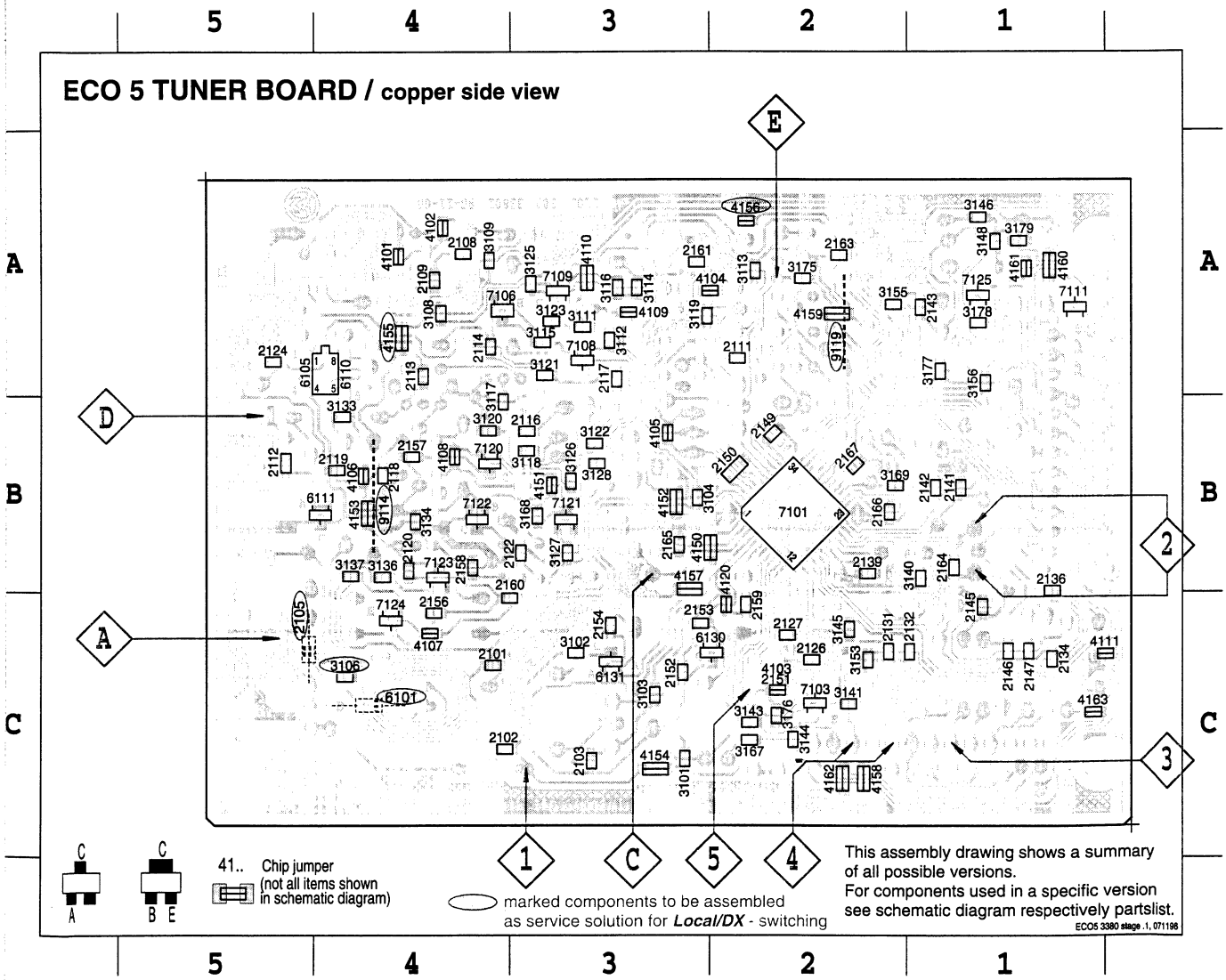
4) MW has to be aligned before LW.

↕ Repeat

1101 A1	2106 C2	2137 C5	3147 B5	3172 C5	5112 C4	5130 A3	7104 C2	9118 B4	9130 C3
1102 A1	2107 C2	2138 A5	3149 C5	3173 A5	5113 B3	5131 A3	7105 C3	9119 C4	9131 A5
1103 C1	2110 C2	2140 B5	3152 A5	5102 C2	5114 C4	6101 A2	7107 B3	9120 B4	9133 C3
1104 B1	2115 C1	2144 B5	3154 C5	5103 C2	5115 A4	6102 A1	9100 A2	9121 A2	9134 B3
1105 A1	2123 A2	2148 B4	3157 B5	5104 C2	5116 A4	6103 A1	9101 B3	9122 C3	9136 A5
1119 C5	2125 A2	2155 A3	3158 A5	5105 B2	5120 B4	6104 A2	9105 B2	9123 B1	9137 A5
1120 A5	2128 C3	2162 A2	3159 A5	5106 B2	5121 B4	6106 B3	9111 C2	9124 C4	
1130 B5	2129 C4	3105 B3	3160 A5	5108 C4	5122 B3	6107 C5	9113 B2	9125 A3	
1131 B5	2130 A4	3110 A2	3161 A5	5109 B4	5123 B2	6109 C2	9114 B2	9126 B5	
2104 A2	2133 A4	3132 B3	3170 C5	5110 B4	5124 B2	6120 C4	9115 B3	9128 A2	
2105 A1	2135 B5	3142 A4	3171 C5	5111 C3	5126 B3	7102 A3	9117 B2	9129 B3	


ECO 5 TUNER BOARD / component side view
In the East European version coil 5130 has to be rotated 180°.
FM 75 OHM
FM 300 OHM
AM FRAME AERIAL
SW
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
SEARCH SENS.
Voltage multiplier board
VCC2 VCC RIGHT GND LEFT ENABLE DATA STEREO CLOCK DATA ENABLE MPX GND
AM-IF GND +FM R-FM L-FM L out R out VCOkill STSIG STEREO V+
Connector for AM - stereo Module
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.
marked components to be assembled as service solution for Local/DX - switching
2SA... BC...
ECO5 3380 stage .1, 071196

2101 C4	2119 B4	2141 B1	2154 C3	3101 C3	3116 A3	3133 B4	3153 C2	4103 C2	4151 B3	6110 A4	7121 B3
2102 C4	2120 B4	2142 B1	2156 C4	3102 C3	3117 B4	3134 B4	3155 A2	4104 A2	4152 B3	6111 B4	7122 B4
2103 C3	2122 B3	2143 A1	2157 B4	3103 C3	3118 B3	3136 B4	3156 A1	4105 B3	4153 B4	6130 C2	7123 B4
2108 A4	2124 A5	2145 C1	2158 B4	3104 B3	3120 B4	3137 B4	3167 C2	4106 B4	4154 C3	6131 C3	7124 C4
2109 A4	2126 C2	2146 C1	2159 C2	3106 C4	3121 A3	3140 B1	3168 B3	4107 C4	4155 A4	7101 B2	
2112 B5	2127 C2	2147 C1	2160 C4	3108 A4	3122 B3	3141 C2	3169 B2	4108 B4	4156 A2	7103 C2	
2113 A4	2131 C2	2149 B2	2161 A3	3109 A4	3123 A3	3143 C2	3175 A2	4109 A3	4157 B3	7106 A4	
2114 A4	2132 C1	2150 B2	2163 A2	3111 A3	3125 A3	3144 C2	3176 C2	4110 A3	4158 C2	7108 A3	
2116 B3	2134 C1	2151 C2	2165 B3	3112 A3	3126 B3	3145 C2	3177 A1	4111 C1	4159 A2	7109 A3	
2117 A3	2136 B1	2152 C3	2166 B2	3114 A3	3127 B3	3146 A1	4101 A4	4120 C2	4160 A1	7111 A1	
2118 B4	2139 B2	2153 C3	2167 B2	3115 A3	3128 B3	3148 A1	4102 A4	4150 B2	6105 A4	7120 B4	



7B-3

TUNER BOARD ECO5 / Systems

VERSION PROGRAMMING COMPONENTS					
	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/MW-Stereo	-	-	x	-	SW
/17 FM/MW	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

1101 A 1
1102 B 2
1103 D 2
1121 E20
1124 G20
1126 E20
1130 I20
1131 I20
2101 C 6
2102 G 7
2103 D 9
2104 B 6
2106 F 5
2107 G 6
2108 G 3
2109 G 3
2111 C13
2120 L11
2122 N11
2123 M11
2125 M11
2126 G 9
2127 G10
2128 C11
2129 C 9
2130 H17
2131 I10
2132 I10
2133 H11
2135 J17
2136 J17
2137 J18
2138 H12
2139 I13
2140 H14
2141 H14
2142 H14
2143 I17
2144 H17
2145 G16
2146 F15
2147 F16
2148 F16
2149 C15
2150 B13
2152 F 7
2153 E 8
2154 E 7
2155 D 8
2158 M11
2159 F 9
2160 M12
2161 D16
2163 E16
2164 H14
2165 C 9
2166 G16
2167 F16
3101 E 7
3102 E 7
3103 C 8
3104 B11
3105 C 7
3106 E 3
3109 F 2
3110 F 6
3113 C13
3119 B13
3120 C 6
3123 M 7
3125 M 6
3128 M 8
3132 L 9
3134 M12
3137 M13
3140 I13
3141 G10
3142 G 9
3143 I10
3144 I10
3145 H10
3146 I17
3147 I15
3152 H18
3153 H19
3154 H18
3155 H17
3156 G17
3157 F17
3158 F18
3159 F18
3160 E18
3161 E18
3167 G18
3169 G15
3170 F17
3171 H15
3175 B16
3176 J 9
3177 I18
3178 I15
3179 I16
4101 G 5
4102 F 5
4103 G 9
4104 B13
4105 B11
4106 K12
4108 L 9
5102 E 4
5103 F 4
5109 B13
5110 B14
5111 A13
5112 A15
5113 B12
5114 C16
5120 H13
5121 F15
5122 M11
5123 L11
6130 E 8
6131 D 8
6103 C 2
6104 C 3
6105 K12
6105 E 6
6106 C 6
6107 H17
6120 G16
6130 E 7
6131 D 7
7101 G11
7102 D 8
7103 I 9
7104 E 3
7105 F 2
7109 M 7
7111 F18
7119 B13
7122 M 9
7124 M13
7125 I16
9100 B 4
9117 C 6
9117 L10
9128 A 4

MISCELLANEOUS

1101	4822 267 31505	SOCKET CLICKFIT (/14)
1102	4822 267 10283	SOCKET COAXIAL 75Ω

CAPACITORS

2101	5322 122 32531	100pF 5% 50V
2101	5322 122 32452	47pF 5% 50V -/37
2102	4822 122 33177	10nF 20% 50V
2103	5322 122 34123	1nF 10% 50V
2104	4822 122 33195	100pF 10% 50V
2106	4822 125 50355	TRIMCAP. 4-20pF (/00,/34)
2106	4822 125 60101	TRIMCAP. 3-11pF (/21,/37)
2107	4822 121 51319	1µF 10% 63V
2108	5322 122 32531	100pF 5% 50V (/00,/34)
2109	5322 122 32448	10pF 5% 50V (/00,/34)
2120	5322 122 31946	27pF 5% 63V (/00,/34)
2120	5322 122 32658	22pF 5% 50V (/21,/37)
2122	4822 122 33891	3.3nF 10% 63V (/00,/34)
2123	4822 121 51254	390pF 1% 400V (/00,/34)
2125	4822 121 51381	560pF 5% 400V
2126	5322 122 31863	330pF 5% 50V
2127	4822 126 13473	220nF +80-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 41584	100µF 20% 10V
2130	4822 126 11585	22nF +80-20% 25V
2131	4822 126 13482	470nF 16V
2132	4822 126 13482	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 122 33128	15nF 10% 63V (not for /37)
2134	5322 122 32654	22nF 10% 63V (/37)
2135	4822 124 40746	0.22µF 20% 63V
2136	4822 122 33128	15nF 10% 63V
2136	5322 122 32654	22nF 10% 63V (/37)
2137	4822 124 40746	0.22µF 20% 63V
2138	4822 124 41576	2.2µF 20% 50V
2139	5322 122 32447	1pF 5% 50V
2141	4822 126 10002	100nF 20% 63V
2142	4822 126 10002	100nF 20% 63V
2143	4822 126 13473	220nF +80-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2146	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 126 11585	22nF +80-20% 25V
2149	5322 122 32654	22nF 10% 63V
2150	4822 122 31947	100nF 20% 63V
2152	5322 116 80853	560pF 5% 63V (/34)
2152	4822 122 33342	33nF 10% 63V
2153	4822 122 32139	12pF 2% 63V (/34)
2153	4822 126 13689	18pF 1% 63V

CAPACITORS

2155	4822 125 60101	3P0-11pF N45 100V
2158	5322 122 32448	10pF 5% 50V (/00,/34)
2159	5322 122 32659	33pF 5% 50V
2160	5322 122 32654	22nF 10% 63V
2161	4822 126 10002	100nF 20% 63V (/00,/34)
2163	4822 126 10002	100nF 20% 63V (/00,/34)
2164	4822 126 13482	470nF 20% 16V
2165	4822 126 10002	100nF 20% 63V
2166	5322 122 34123	1nF 10% 50V
2167	4822 122 32139	12pF 2% 63V

RESISTORS

3101	4822 051 20562	5k6 5% 0.1W (/34)
3101	4822 051 20333	33k 5% 0.1W
3102	4822 051 20104	100k 5% 0.1W
3103	4822 051 20183	18k 5% 0.1W
3104	4822 051 20181	180Ω 5% 0.1W
3105	4822 116 52215	220Ω 5% 0.5W
3108	4822 051 20222	2k2 5% 0.1W (/00,/34)
3109	4822 051 20472	4k7 5% 0.1W (/00,/34)
3110	4822 116 52195	47Ω 5% 0.5W
3120	4822 051 20008	0Ω Jumper
3123	4822 051 20472	4k7 5% 0.1W (/00,/34)
3125	4822 051 20103	10k 5% 0.1W (/00,/34)
3128	4822 051 20222	2k2 5% 0.1W (/00,/34)
3132	4822 116 52195	47Ω 5% 0.5W
3134	4822 051 20224	220k 5% 0.1W
3137	4822 051 20223	22k 5% 0.1W (/00,/34)
3140	4822 051 20008	0Ω Jumper (if 5120 4822 242 82065)
3140	4822 117 10353	150Ω 1% 0.1W (if 5120 4822 242 10251)
3141	4822 051 20563	56k 5% 0.1W
3142	4822 100 11163	100k 30%LIN 0.1W
3145	4822 051 20222	2k2 5% 0.1W
3146	4822 051 20229	22Ω 5% 0.1W
3152	4822 116 52224	470Ω 5% 0.5W
3153	4822 051 20471	470Ω 5% 0.1W
3154	4822 116 52211	150Ω 5% 0.5W
3155	4822 051 20471	470Ω 5% 0.1W
3156	4822 051 20104	100k 5% 0.1W (/01)
3157	4822 116 52234	100k 5% 0.5W (/17)
3158	4822 116 83883	470Ω 5% 0.5W
3159	4822 116 83883	470Ω 5% 0.5W
3160	4822 116 83883	470Ω 5% 0.5W
3161	4822 116 83883	470Ω 5% 0.5W
3167	4822 051 20221	220Ω 5% 0.1W
3169	4822 051 20154	150k 5% 0.1W
3170	4822 116 52234	100k 5% 0.5W (not for /00)
3171	4822 116 52219	330Ω 5% 0.5W

ELECTRICAL PARTSLIST TUNER EC05 BOARD 7B-4

JUMPER

4101	4822 051 20008	0Ω Jumper (not for /00)
4102	4822 051 20008	0Ω Jumper (not for /00)
4103	4822 051 20008	0Ω Jumper
4104	4822 051 20008	0Ω Jumper
4105	4822 051 20008	0Ω Jumper
4106	4822 051 20008	0Ω Jumper
4108	4822 051 20008	0Ω Jumper
4111	4822 051 20008	0Ω Jumper
4120	4822 051 20008	0Ω Jumper
4150	4822 051 10008	0Ω 5% 0.25W
4151	4822 051 20008	0Ω Jumper (/00,/34)
4152	4822 051 10008	0Ω 5% 0.25W
4153	4822 051 10008	0Ω 5% 0.25W
4154	4822 051 10008	0Ω 5% 0.25W
4155	4822 051 10008	0Ω 5% 0.25W (/00,/34)
4156	4822 051 20008	0Ω Jumper (/00,/34)
4157	4822 051 10008	0Ω 5% 0.25W
4158	4822 051 10008	0Ω 5% 0.25W
4159	4822 051 10008	0Ω 5% 0.25W

COILS

5102	4822 157 71634	RF-COIL MW
5103	4822 157 71635	RF-COIL LW
5122	4822 157 60517	OSC. COIL LW
5123	4822 157 60517	OSC. COIL MW
5130	4822 156 30947	RF-COIL 1.5 T
5131	4822 156 30947	RF-COIL 1.5 T

CRYSTALS/FILTERS

5109	4822 242 70665	Ceram Filter 10.7MHZ
5110	4822 242 70665	Ceram Filter 10.7MHZ
5111	4822 158 60511	AM-IF Filter 450KHZ
5112	4822 157 70302	AM-IF Filter 450KHZ
5114	4822 157 71637	AM-AFC Filter 450KHZ
5120	4822 242 82065	CER.DISCRIMINATOR
5120	4822 242 10251	CER.DISCRIMINATOR
5121	4822 242 10261	QUARTZ 75KHZ

DIODES

6103	4822 130 30621	1N4148
6104	4822 130 30621	1N4148
6105	4822 130 83075	HN1V02H. VARICAP.
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148
6130	4822 130 82833	1SV228
6131	4822 130 82833	1SV228

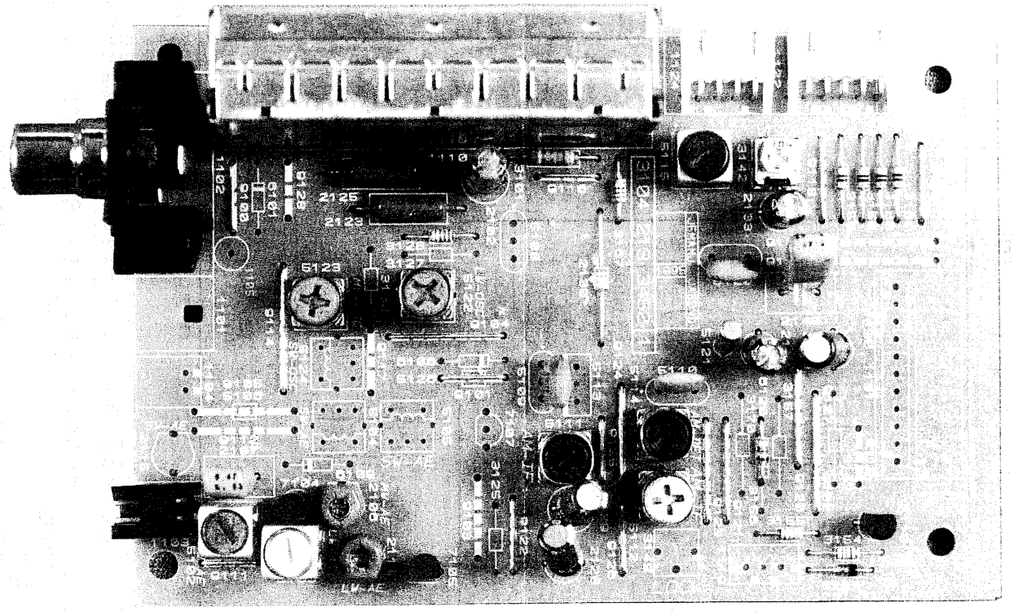
INTERGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1.RADIO IC

TRANSISTORS

7102	4822 130 60093	2SA838B
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7111	5322 130 42136	BC848C
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note: Only the parts mentioned in this list are normal service parts.



TUNER 95 BOARD

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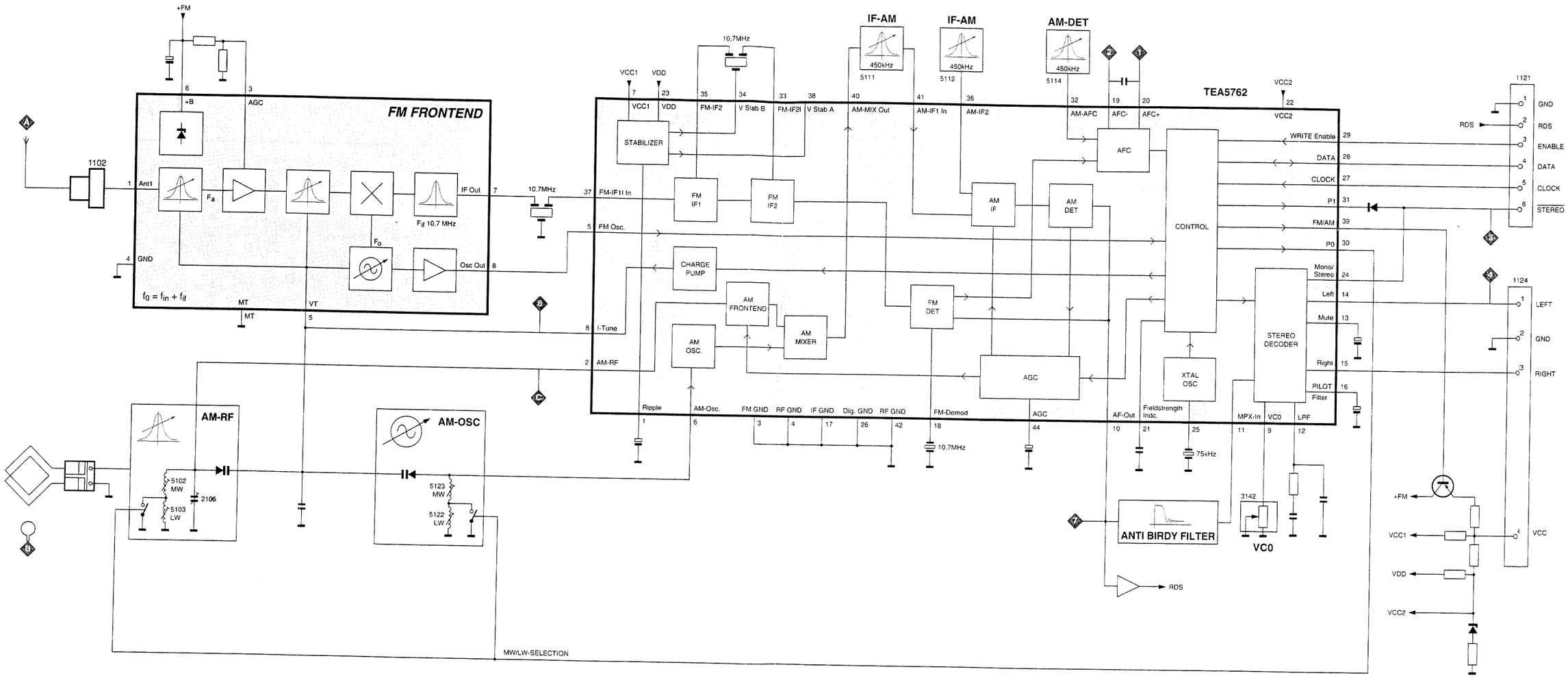
BLOCKDIAGRAM



ADJUSTMENT TABLE

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	◇6	7...9V
			87.5MHz	check		1.3...2V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8.3V ±0.2V
			531kHz	check		1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8.3V ±0.2V
			153kHz	check		1V ±0.4V
FM - VCO						
FM	98MHz 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz
DISTORTION						
FM	98MHz 1mV 90% L, 9% pilot mod=1kHz	◇A	98MHz	mixcoil inside tuner 1110	◇4	min. distortion
AM IF						
MW	450kHz Δf=10kHz as low as possible	100nF, 50R, ◇C		5111	◇7	symmetrical and max. height ↕
				5112		
	450.0kHz continuous wave	◇C		5114	◇1 ◇2	0mV ±2mV
AM RF						
MW	588kHz mod=1kHz, 30% AM 1494kHz	◇B*	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod=1kHz, 30% AM		198kHz	5103		MAX

* Signal supplied via frame antenna

↕ Repeat

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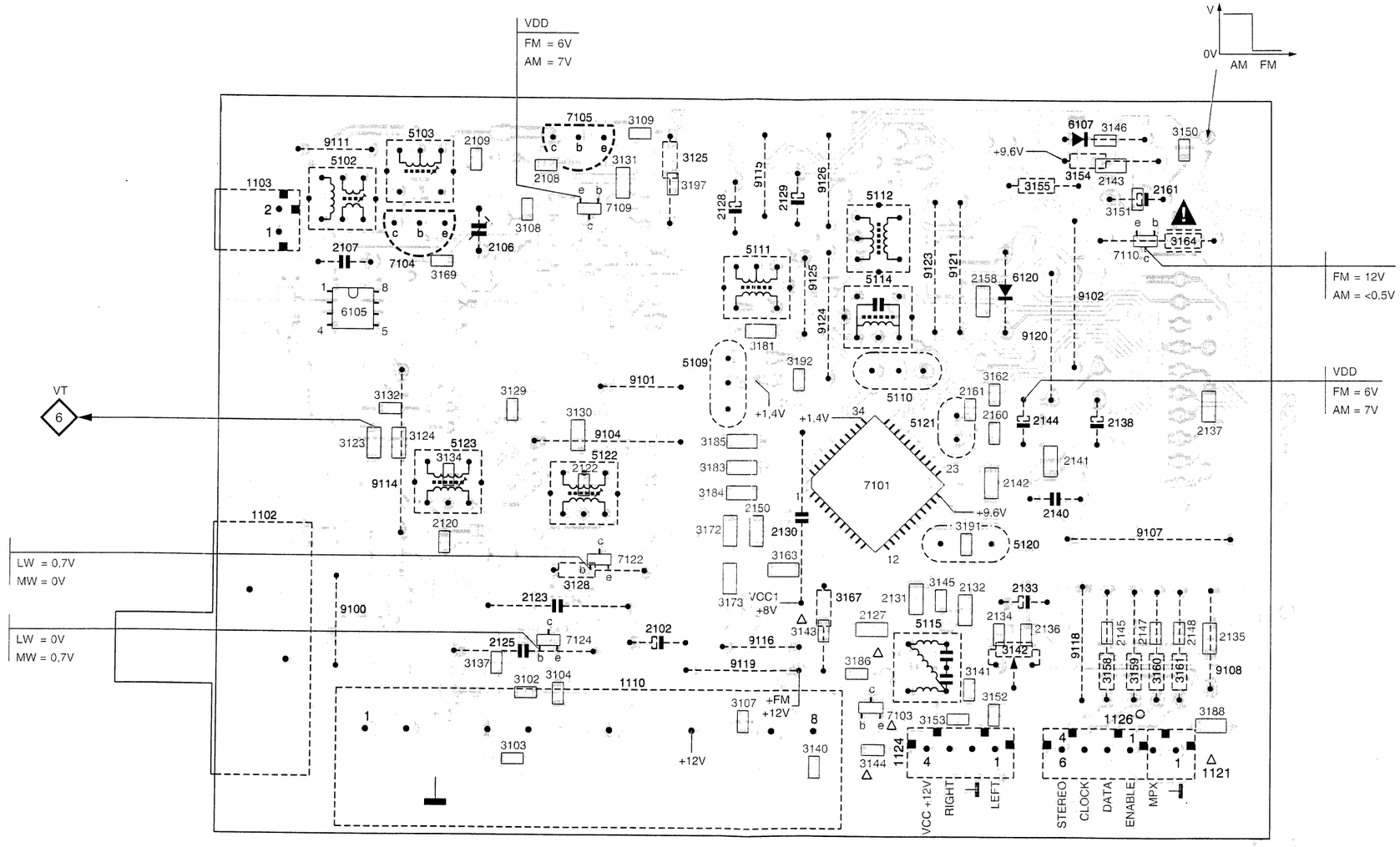
TUNER 95 – Copperside view



1102	F4	3181	D8
1103	C3	3183	E7
1110	G7	3184	E7
1121	H11	3185	E7
1124	H9	3186	G8
1126	G10	3188	G11
2102	G7	3191	F9
2106	C5	3192	D8
2107	D4	3197	C7
2108	C6	5102	C4
2109	C5	5103	C5
2120	F5	5109	D7
2122	E6	5110	E9
2123	F6	5111	C8
2125	G5	5112	C9
2127	F8	5114	D9
2128	C7	5115	G9
2129	C8	5120	F10
2130	F8	5121	E9
2131	F9	5122	E6
2132	F9	5123	E5
2133	F10	6105	D4
2134	F9	6107	B10
2135	G11	6120	D10
2136	G10	7101	E9
2137	E11	7103	G9
2138	E10	7104	D5
2140	F10	7105	B6
2141	E10	7109	C6
2142	E10	7110	D11
2143	C10	7122	F7
2144	E10	7124	G6
2145	G11	9100	F4
2147	G11	9101	E7
2148	G11	9102	D10
2150	F8	9104	E6
2158	D9	9107	F11
2160	E9	9108	G11
2161	E9	9111	C4
2161	C11	9114	E5
3102	G6	9115	C8
3103	H6	9116	G8
3104	G6	9118	G10
3107	G7	9119	G7
3108	C6	9120	D10
3109	B7	9121	D9
3123	E4	9123	D9
3124	E5	9124	D8
3125	C7	9125	D8
3128	F6	9126	C8
3129	E6		
3130	E6		
3131	C6		
3132	E5		
3134	E5		
3137	G5		
3140	H8		
3141	G9		
3142	G10		
3143	G8		
3144	H8		
3145	F9		
3146	B10		
3150	C11		
3151	C10		
3152	G9		
3153	G9		
3154	C10		
3155	C10		
3158	G10		
3159	G11		
3160	G11		
3161	G11		
3162	E9		
3163	F8		
3164	C11		
3167	F8		
3169	D5		
3172	F7		
3173	F7		

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| | | |

ELECTRICAL PARTSLIST TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	SOCKET COAX IEC 75R
1103	4822 265 31184	JST CONNECTOR 2 POLE
1110	4822 210 10492	FRONTEND ASSY /02/08

DIODES

6105	4822 130 83075	HN1V02H
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS

7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1

COILS

5102	4822 157 71634	RF-COIL MW
5103	4822 157 71635	RF-COIL LW
5109	4822 157 71639	CER. FILTER 10,7MHz
5110	4822 242 70665	CER. FILTER 10,7MHZ
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 71637	AM-AFC FILTER 450KHZ
5115	4822 157 71636	ANTI-BIRDY FILTER
5120	4822 242 82065	CER. DISCRIMINATOR
5121	4822 242 81021	QUARTZ 75kHz
5122	4822 157 60517	RF-COIL AM
5123	4822 157 60517	RF-COIL AM

RESISTORS

3125	4822 116 83864	10k	5%	0,5W
3128	4822 116 52256	2k2	5%	0,16W
3142	4822 100 11163	TRIMPOT. 100K LIN.		
3154	4822 116 52215	220R	5%	0,16W
3155	4822 116 52219	330R	5%	0,5W
3158	4822 116 52224	470R	5%	0,5W
3159	4822 116 52224	470R	5%	0,5W
3160	4822 116 52224	470R	5%	0,5W
3161	4822 116 52224	470R	5%	0,5W
3164	4822 052 10478	4R7	5%	NFR
3167	4822 116 52215	220R	5%	0,16W

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3103	4822 051 20184	180k	5%	0,1W
3104	4822 051 10102	1k	2%	0,25W
3107	4822 051 20829	82R	5%	0,1W
3108	4822 051 20222	2k2	5%	0,1W
3109	4822 051 20222	2k2	5%	0,1W
3123	4822 051 10008	CHIP JUMPER 1206		
3124	4822 051 10008	CHIP JUMPER 1206		
3129	4822 051 20008	CHIP JUMPER 0805		
3130	4822 051 10008	CHIP JUMPER 1206		

CHIP RESISTORS

3131	4822 051 10008	CHIP JUMPER 1206		
3132	4822 051 20008	CHIP JUMPER 0805		
3134	4822 051 20223	22k	5%	0,1W
3137	4822 051 20103	10k	5%	0,1W
3140	4822 051 20331	330R	5%	0,1W
3141	4822 051 20563	56k	5%	0,1W
3143	4822 051 20223	22k	5%	0,1W
3144	4822 051 10102	1k	2%	0,25W
3145	4822 051 20222	2k2	5%	0,1W
3146	4822 051 20479	47R	5%	0,1W
3150	4822 051 20472	4k7	5%	0,1W
3151	4822 051 20683	68k	5%	0,1W
3152	4822 051 20471	470R	5%	0,1W
3153	4822 051 20471	470R	5%	0,1W
3162	4822 051 20154	150k	5%	0,1W
3163	4822 051 10008	CHIP JUMPER 1206		
3169	4822 051 20008	CHIP JUMPER 0805		
3172	4822 051 10008	CHIP JUMPER 1206		
3173	4822 051 10008	CHIP JUMPER 1206		
3181	4822 051 10008	CHIP JUMPER 1206		
3183	4822 051 10008	CHIP JUMPER 1206		
3184	4822 051 10008	CHIP JUMPER 1206		
3185	4822 051 10008	CHIP JUMPER 1206		
3186	4822 051 10102	1k	2%	0,25W
3188	4822 051 10008	CHIP JUMPER 1206		
3191	4822 051 20008	CHIP JUMPER 0805		
3192	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20472	4k7	5%	0,1W

CAPACITORS

2102	4822 124 40433	47µF	20%	25V
2106	4822 125 60102	30pF		VARIABLE
2107	4822 121 51252	470nF	5%	63V
2123	4822 121 51254	390pF	1%	400V
2125	4822 121 51381	560pF	1%	400V
2128	4822 124 41579	10µF	20%	50V
2129	4822 124 40242	1µF	20%	63V
2130	4822 126 11585	22nF	20%	50V
2133	4822 124 40242	1µF	20%	63V
2138	4822 124 41576	2,2µF	20%	50V
2140	4822 121 51252	470nF	5%	63V
2144	4822 124 40242	1µF	20%	63V
2162	4822 124 41596	22µF	20%	50V

CHIP CAPACITORS

2108	4822 122 33515	82pF	5%	50V
2109	5322 122 31946	27pF	5%	50V
2120	5322 122 32659	33pF	5%	50V
2122	5322 126 10465	3,9nF	10%	63V
2127	4822 122 32927	220nF	10%	63V
2131	4822 122 33325	470nF	20%	50V
2132	4822 122 33325	470nF	20%	50V
2134	4822 122 33128	15nF	10%	63V
2135	4822 122 32927	220nF	10%	63V
2136	4822 122 33128	15nF	10%	63V
2137	4822 122 32927	220nF	10%	63V
2141	4822 122 31947	100nF	20%	50V
2142	4822 122 31947	100nF	20%	50V
2143	4822 122 32927	220nF	10%	63V
2145	4822 122 33575	220pF	5%	50V
2147	4822 122 33575	220pF	5%	50V

7D-4

ELECTRICAL PARTSLIST TUNER 95 BOARD

CHIP CAPACITORS

2148	4822 122 33575	220pF	5%	50V
2150	4822 122 31947	100nF	20%	50V
2158	4822 122 31947	100nF	20%	50V
2160	4822 122 32139	12pF	5%	63V
2161	5322 122 34123	1nF	10%	50V

KARAOKE BOARD

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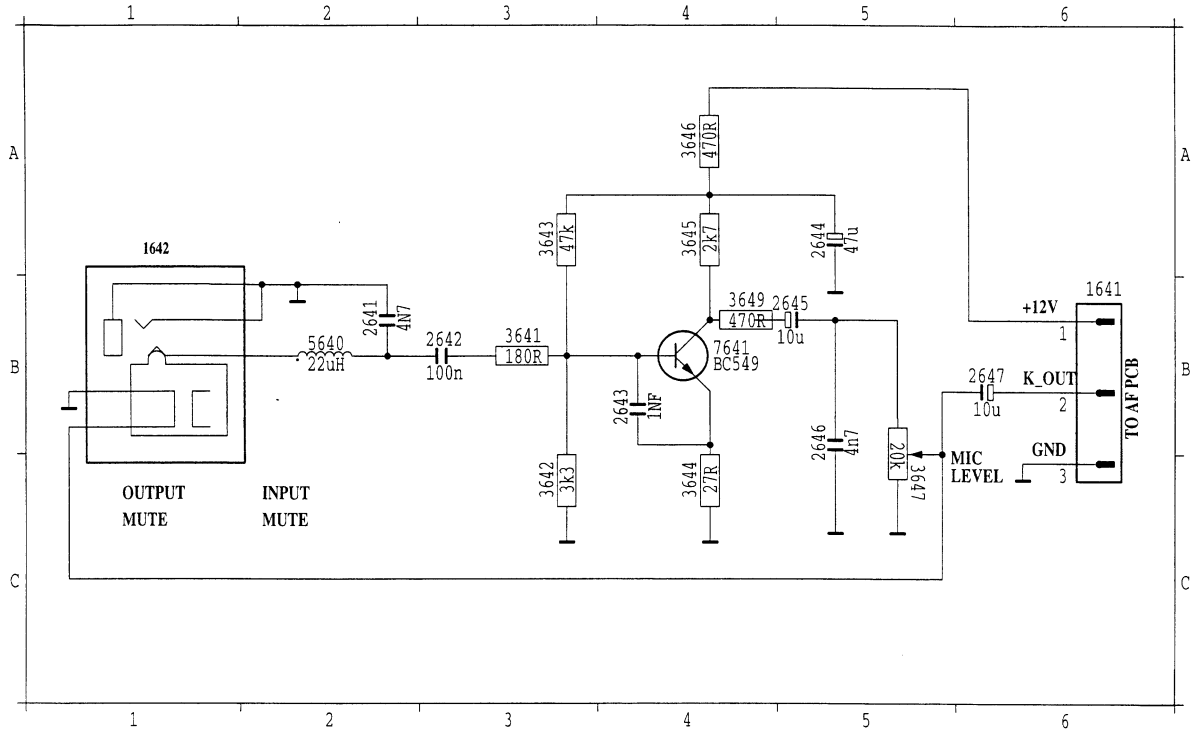
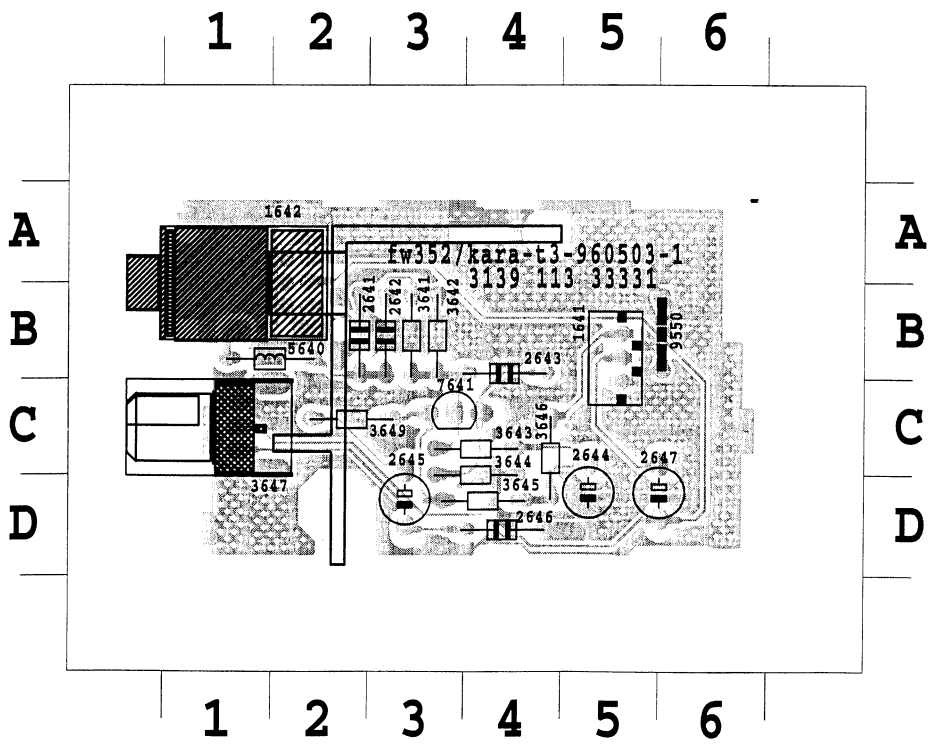
KARAOKE CIRCUIT & LAYOUT

1641 B 6 2642 B 3 2645 B 5 3641 B 3 3644 C 4 3647 C 5 7641 B 4
1642 A 1 2643 B 4 2646 B 5 3642 C 3 3645 A 4 3649 B 4
2641 B 2 2644 A 5 2647 B 6 3643 A 3 3646 A 4 5640 B 2



1641 B 5 2643 B 4 2647 D 6 3644 D 4 3649 C 2
1642 B 1 2644 D 5 3641 B 3 3645 D 4 5640 B 1
2641 B 2 2645 D 3 3642 B 3 3646 C 4 7641 C 3
2642 B 3 2646 D 4 3643 C 4 3647 C 1 9550 B 6



KARAOKE BOARD PARTSLIST

MISCELLANEOUS

2	4822 402 10222	Bracket
1642	4822 267 40898	Connector

CAPACITORS

2641	4822 126 11714	4.7nF 20% 50V
2642	4822 126 12882	100nF+80-20% 50V
2643	4822 122 33197	1nF 10% 50V
2644	4822 124 41751	47µF 20% 50V
2645	4822 124 41579	10µF 20% 50V
2646	4822 126 11714	4.7nF 20%
2647	4822 124 41579	10µF 20% 50V

RESISTORS

3641	4822 116 52213	180Ω 5% 0.5W
3642	4822 116 52269	3k3 5% 0.5W
3643	4822 116 52284	47k 5% 0.5W
3644	4822 116 52188	27Ω 5% 0.5W
3645	4822 116 52263	2k7 5% 0.5W
3646	4822 116 52224	470Ω 5% 0.5W
3647	4822 101 21204	20k Variable
3649	4822 116 52224	470Ω 5% 0.5W

TRANSISTOR

7641	4822 130 41096	BC550C

COIL

5640	4822 157 52983	Coil 2.2µH 10%

MTF TAPE MODULE

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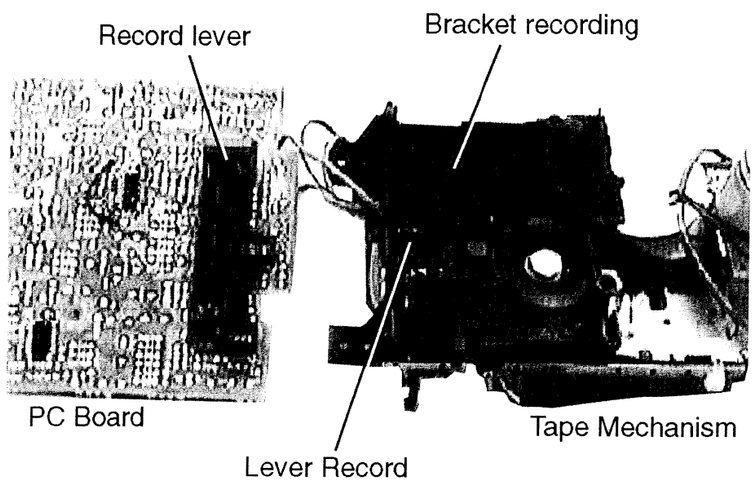
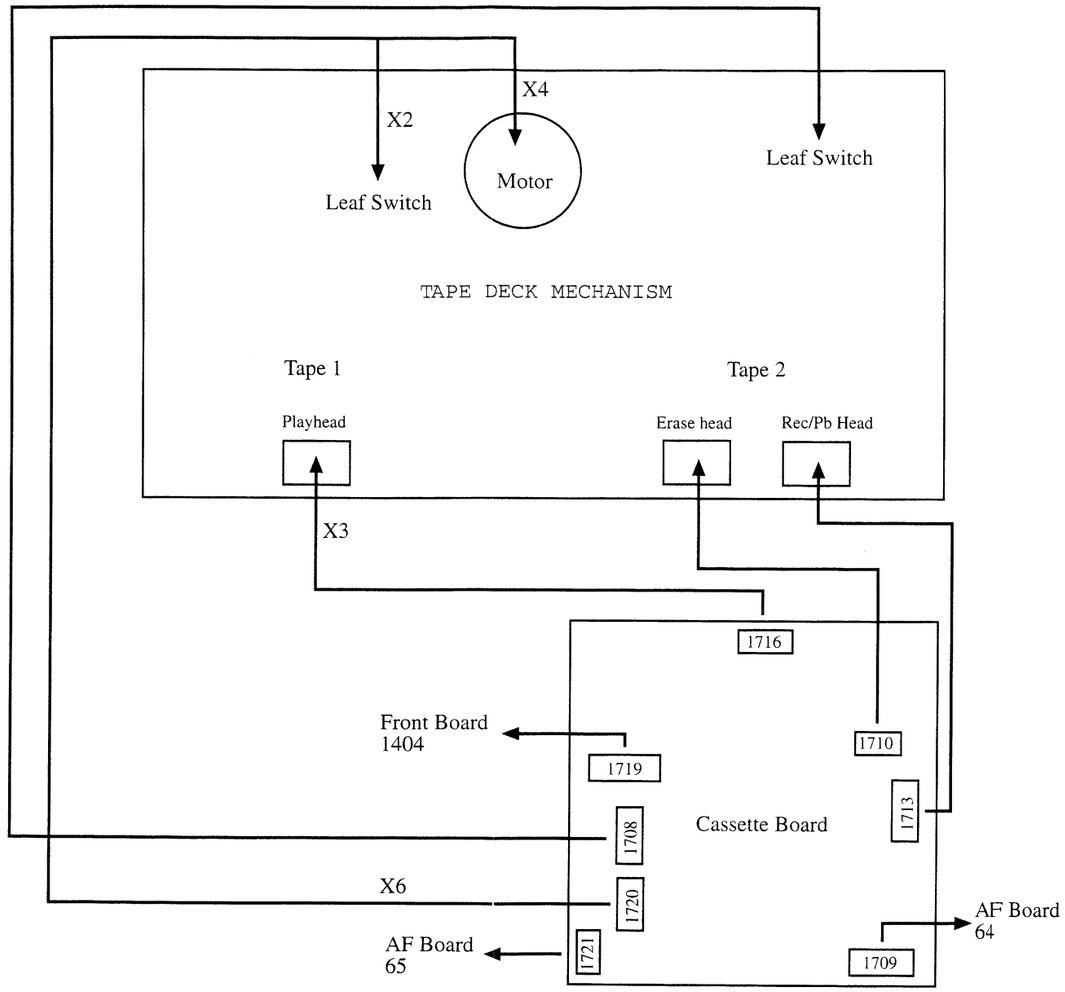


9-1

Tape Deck Wiring Diagram



TAPE MECHANISM ADJUSTMENT

ADJUSTMENT	CASSETTE	DECK1	DECK2	MEASURE ON	READ ON	ADJUST WITH	ADJUST TO
Azimuth	10kHz	Play	-	T019/ T020	mV-meter	Left hand screw of Play or R/P head	Maximum
	SBC420*	-	Play				L = R
Motor speed	3150Hz	Play	-	T019/ T020	Wow and Futter meter	Preset in motor	**a
	SBC420*	-	Play				

* SBC 420: 4822 397 30071
**a: The maximum permissible speed deviation is 2%. Moreover, the Wow & Flutter value can be read. This value should not exceed 0.4%.

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| | | |

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MTF CASSETTE BOARD

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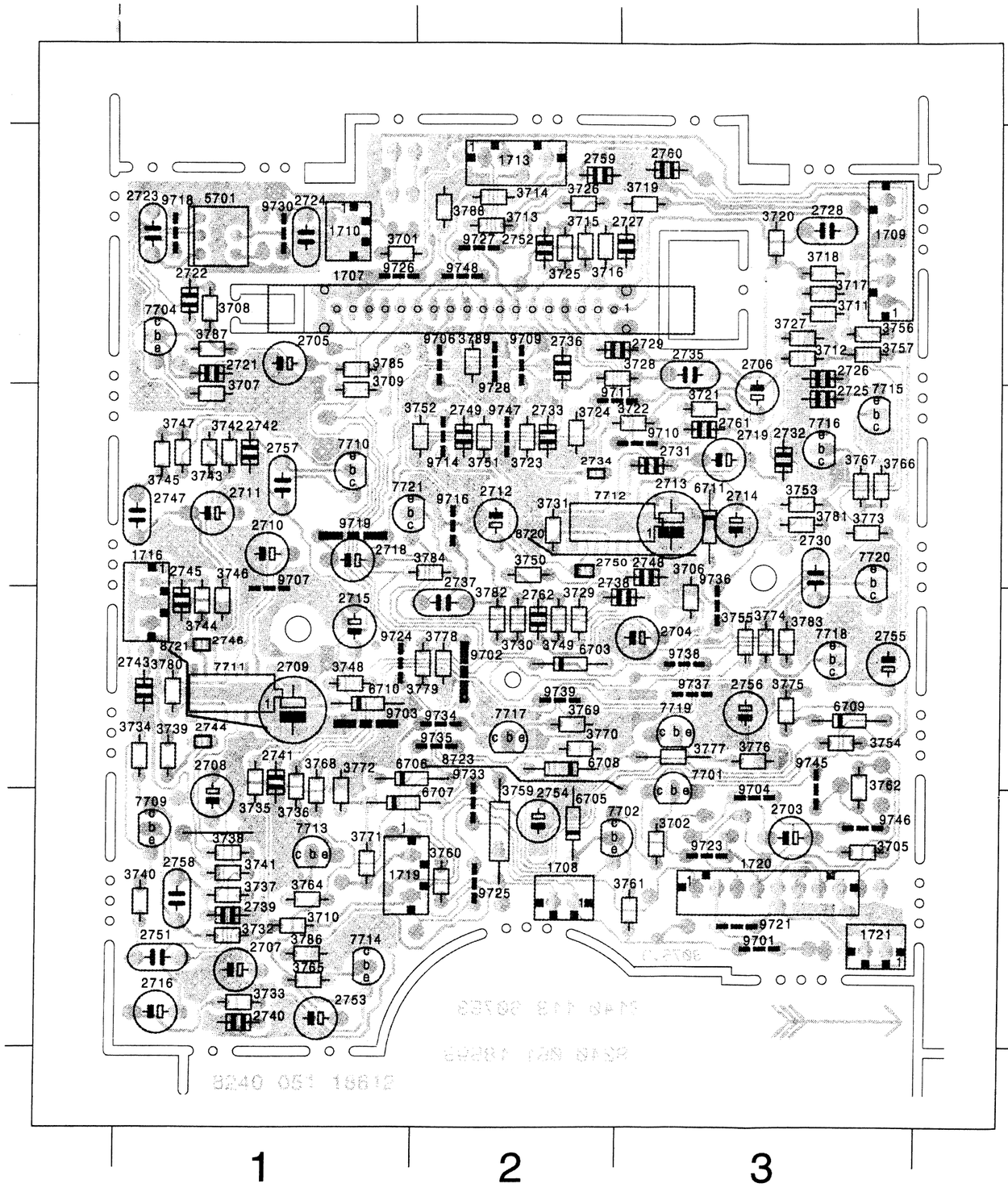


1707 A 2	2752 A 2	3748 C 1	7713 D 1
1708 D 2	2753 D 1	3749 C 2	7714 D 1
1709 A 3	2754 D 2	3750 B 2	7715 B 3
1710 A 1	2755 C 3	3751 B 2	7716 B 3
1713 A 2	2756 C 3	3752 B 2	7717 C 2
1716 C 1	2757 B 1	3753 B 3	7718 C 3
1719 D 1	2758 D 1	3754 C 3	7719 C 3
1720 D 3	2759 A 2	3755 C 3	7720 B 3
1721 D 3	2760 A 3	3756 A 3	7721 B 1
2703 D 3	2761 B 3	3757 A 3	9701 D 3
2704 C 3	2762 C 2	3759 D 2	9702 C 2
2705 A 1	3701 A 1	3760 D 2	9703 C 1
2706 B 3	3702 D 3	3761 D 3	9704 D 3
2707 D 1	3705 D 3	3762 C 3	9706 A 2
2708 D 1	3706 C 3	3764 D 1	9707 C 1
2709 C 1	3707 B 1	3765 D 1	9709 A 2
2710 B 1	3708 A 1	3766 B 3	9710 B 3
2711 B 1	3709 B 1	3767 B 3	9711 B 2
2712 B 2	3710 D 1	3768 D 1	9714 B 2
2713 B 3	3711 A 3	3769 C 2	9716 B 2
2714 B 3	3712 A 3	3770 C 2	9718 A 1
2715 C 1	3713 A 2	3771 D 1	9719 B 1
2716 D 1	3714 A 2	3772 D 1	9721 D 3
2718 B 1	3715 A 2	3773 B 3	9723 D 3
2719 B 3	3716 A 2	3774 C 3	9724 C 1
2721 A 1	3717 A 3	3775 C 3	9725 D 2
2722 A 1	3718 A 3	3776 C 3	9726 A 1
2723 A 1	3719 A 3	3777 C 3	9727 A 2
2724 A 1	3720 A 3	3778 C 2	9728 A 2
2725 B 3	3721 B 3	3779 C 2	9730 A 1
2726 A 3	3722 B 3	3780 C 1	9733 D 2
2727 A 3	3723 B 2	3781 B 3	9734 C 2
2728 A 3	3724 B 2	3782 C 2	9735 C 2
2729 A 2	3725 A 2	3783 C 3	9736 C 3
2730 B 3	3726 A 2	3784 B 2	9737 C 3
2731 B 3	3727 A 3	3785 A 1	9738 C 3
2732 B 3	3728 A 2	3786 D 1	9739 C 2
2733 B 2	3729 C 2	3787 A 1	9745 D 3
2734 B 2	3730 C 2	3788 A 2	9746 D 3
2735 A 3	3731 B 2	3789 A 2	9747 B 2
2736 A 2	3732 D 1	5701 A 1	9748 A 2
2737 C 2	3733 D 1	6703 C 2	8720 B 2
2738 C 3	3734 C 1	6705 D 2	8721 C 1
2739 D 1	3735 C 1	6706 C 1	8723 C 2
2740 D 1	3736 C 1	6707 D 1	
2741 C 1	3737 D 1	6708 C 2	
2742 B 1	3738 D 1	6709 C 3	
2743 C 1	3739 C 1	6710 C 1	
2744 C 1	3740 D 1	6711 B 3	
2745 C 1	3741 D 1	7701 D 3	
2746 C 1	3742 B 1	7702 D 2	
2747 B 1	3743 B 1	7704 A 1	
2748 B 3	3744 C 1	7709 D 1	
2749 B 2	3745 B 1	7710 B 1	
2750 B 2	3746 C 1	7711 C 1	
2751 D 1	3747 B 1	7712 B 2	

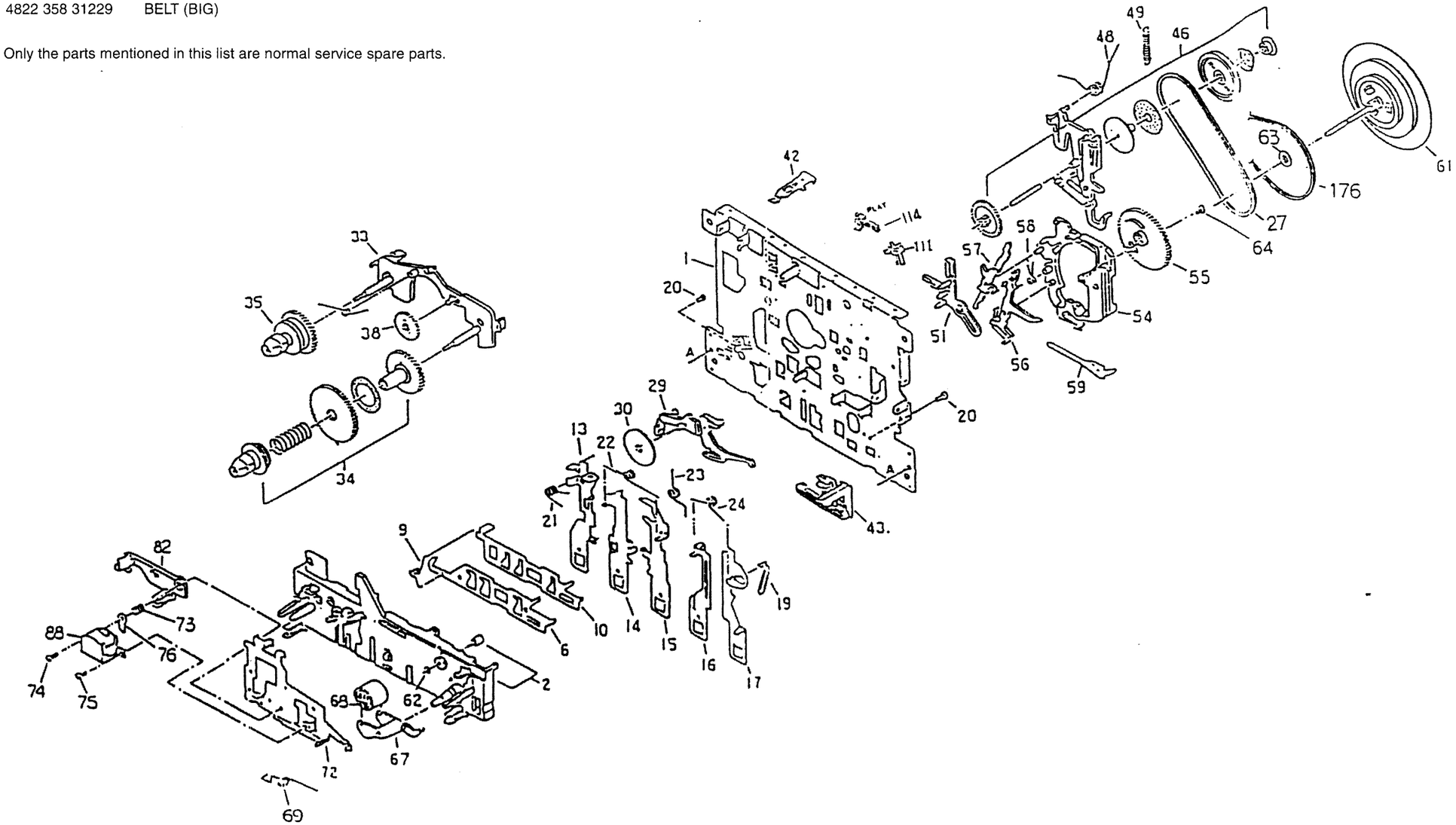
9-4

Exploded View-Play(Mech A)Mechanism

MECHANISM A - PLAYBACK DECK

27	4822 358 31231	BELT DRIVING
43	4822 403 30811	LEVER EJECT
67	4822 402 61418	ARM PINCH
68	4822 528 70785	ROLLER PINCH
88	4822 249 10425	R/P HEAD
111	4822 278 90752	LEAF SWITCH
114	4822 278 90751	LEAF SWITCH
176	4822 358 31229	BELT (BIG)

Note : Only the parts mentioned in this list are normal service spare parts.



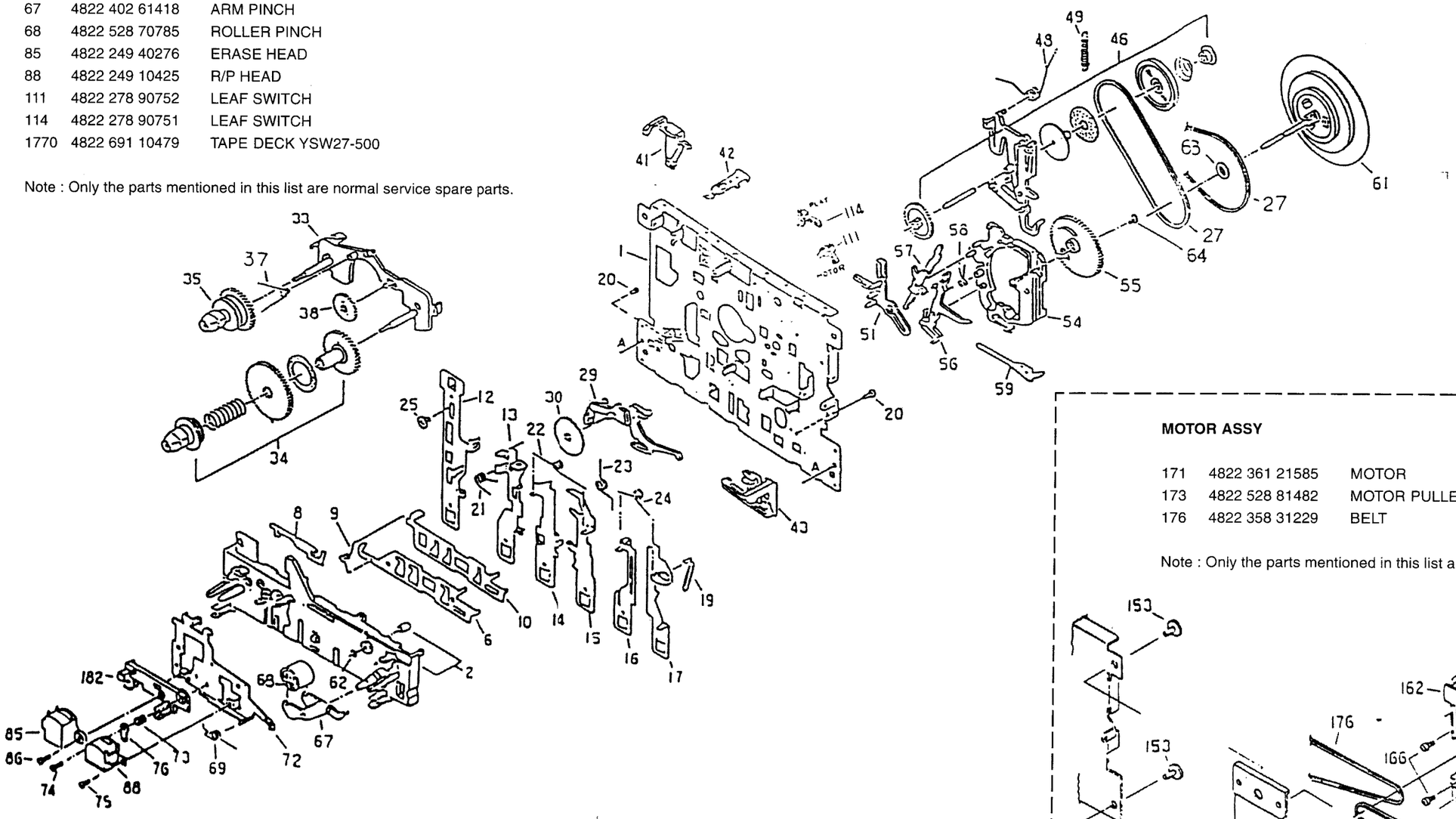
9-5

Exploded View-Rec/PB(Mech B)Mechanism & Motor Assy

MECHANISM B - PLAYBACK DECK

27	4822 358 31231	BELT DRIVING
43	4822 403 30811	LEVER EJECT
67	4822 402 61418	ARM PINCH
68	4822 528 70785	ROLLER PINCH
85	4822 249 40276	ERASE HEAD
88	4822 249 10425	R/P HEAD
111	4822 278 90752	LEAF SWITCH
114	4822 278 90751	LEAF SWITCH
1770	4822 691 10479	TAPE DECK YSW27-500

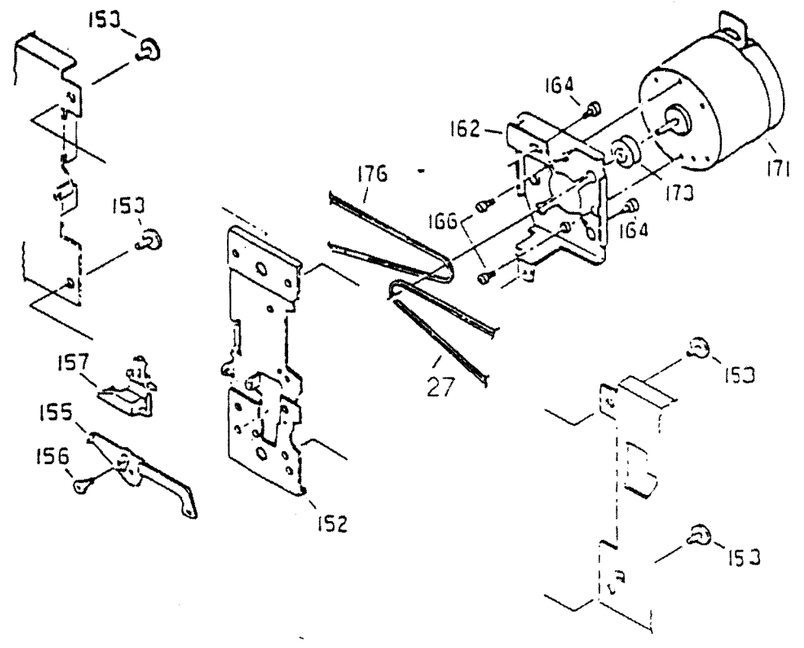
Note : Only the parts mentioned in this list are normal service spare parts.



MOTOR ASSY

171	4822 361 21585	MOTOR
173	4822 528 81482	MOTOR PULLEY
176	4822 358 31229	BELT

Note : Only the parts mentioned in this list are normal service spare parts.



ELECTRICAL PARTSLIST - MTF CASSETTE BOARD

CAPACITORS

2703	4822 124 41397	47µF 20% 25V
2704	4822 124 41596	22µF 20% 50V
2705	4822 124 40246	4.7µF 20% 63V
2706	4822 124 40181	220µF 20% 10V
2707	4822 124 41576	2.2µF 20% 50V
2708	4822 124 40181	220µF 20% 10V
2709	4822 124 80144	220µF 20% 25V
2710	4822 124 41397	47µF 20% 25V
2711	4822 124 40181	220µF 20% 10V
2712	4822 124 40181	220µF 20% 10V
2713	4822 124 80144	220µF 20% 25V
2714	4822 124 41397	47µF 20% 25V
2715	4822 124 41596	22µF 20% 50V
2716	4822 124 41596	22µF 20% 50V
2718	4822 124 41397	47µF 20% 25V
2719	4822 124 41397	47µF 20% 25V
2721	4822 121 51387	10nF 20% 16V
2722	4822 126 11714	4.7nF 20% 50V
2723	4822 121 51304	10nF 10% 50V
2724	4822 121 51306	18nF 10% 50V
2725	4822 126 11714	4.7nF 20% 16V
2726	4822 126 11714	4.7nF 20% 16V
2727	4822 126 12878	1.5nF 10% 50V
2728	4822 121 51305	15nF 10% 50V
2729	4822 126 12787	330pF 10% 50V
2730	4822 121 51304	10nF 10% 50V
2731	4822 126 11585	22nF +80-20% 25V
2732	4822 126 11585	22nF +80-20% 25V
2733	4822 126 12878	1.5nF 10% 16V
2734	5322 122 32311	470pF 10% 100V
2735	4822 121 51305	15nF 10% 50V
2736	4822 126 12787	330pF 10% 50V
2737	4822 121 51304	10nF 10% 50V
2738	4822 126 11585	22nF +80-20% 25V
2739	4822 122 33195	100pF 10% 50V
2740	4822 126 12339	2.2nF 20%
2741	4822 126 12339	2.2nF 20%
2742	4822 122 33195	100pF 10% 50V
2743	4822 126 12878	1.5nF 10% 16V
2744	5322 122 32311	470pF 10% 100V
2745	4822 126 12878	1.5nF 10% 16V
2746	5322 122 32311	470pF 10% 100V
2747	4822 121 51305	15nF 10% 50V
2748	4822 126 11585	22nF +80-20% 25V
2749	4822 126 12878	1.5nF 10% 16V
2750	5322 122 32311	470pF 10% 100V
2751	4822 121 51305	15nF 10% 50V
2752	4822 126 12878	1.5nF 10% 50V
2753	4822 124 40242	1µF 20% 63V
2754	4822 124 41397	47µF 20% 25V
2755	4822 124 40242	1µF 20% 63V
2756	4822 124 41397	47µF 20% 25V
2757	4822 121 51252	470nF 5% 63V
2758	4822 121 51252	470nF 5% 63V
2759	4822 122 33519	470pF 10% 50V
2760	4822 122 33519	470pF 10% 50V
2761	4822 122 33169	680pF 10% 50V
2762	4822 122 33169	680pF 10% 50V

RESISTORS

3701	4822 116 83863	1k 5% 0.5W
3702	4822 116 52284	47k 5% 0.5W
3705	4822 116 83863	1k 5% 0.5W
3706	4822 111 30893	4M7 5% 0.2W
3707	4822 116 52176	10Ω 5% 0.5W
3708	4822 116 83864	10k 5% 0.5W
3709	4822 116 52217	270Ω 5% 0.5W
3710	4822 116 52269	3k3 5% 0.5W
3711	4822 116 52256	2k2 5% 0.5W
3712	4822 116 52256	2k2 5% 0.5W
3713	4822 116 52257	22k 5% 0.5W
3714	4822 116 52257	22k 5% 0.5W
3715	4822 116 52256	2k2 5% 0.5W
3716	4822 116 52303	8k2 5% 0.5W
3718	4822 116 83864	10k 5% 0.5W
3719	4822 116 52256	2k2 5% 0.5W
3720	4822 116 52256	2k2 5% 0.5W
3721	4822 116 52245	150k 5% 0.5W
3722	4822 116 52215	220Ω 5% 0.5W
3723	4822 116 52224	470Ω 5% 0.5W
3724	4822 116 52184	18Ω 5% 0.5W
3725	4822 116 52303	8k2 5% 0.5W
3726	4822 116 83863	1k 5% 0.5W
3727	4822 116 52219	330Ω 5% 0.5W
3728	4822 116 83864	10k 5% 0.5W
3729	4822 116 52256	2k2 5% 0.5W
3730	4822 116 52256	2k2 5% 0.5W
3734	4822 116 52289	5k6 5% 0.5W
3731	4822 116 52245	150k 5% 0.5W
3732	4822 116 83864	10k 5% 0.5W
3733	4822 116 52256	2k2 5% 0.5W
3735	4822 116 83864	10k 5% 0.5W
3736	4822 116 52256	2k2 5% 0.5W
3737	4822 116 52245	150k 5% 0.5W
3738	4822 116 52215	220Ω 5% 0.5W
3739	4822 116 52224	470Ω 5% 0.5W
3740	4822 116 52283	4k7 5% 0.5W
3741	4822 116 52184	18Ω 5% 0.5W
3742	4822 116 52245	150k 5% 0.5W
3743	4822 116 52215	220Ω 5% 0.5W
3744	4822 116 52224	470Ω 5% 0.5W
3745	4822 116 52283	4k7 5% 0.5W
3746	4822 116 52184	18Ω 5% 0.5W
3747	4822 116 52289	5k6 5% 0.5W
3748	4822 116 52224	470Ω 5% 0.5W
3749	4822 116 52245	150k 5% 0.5W
3750	4822 116 52215	220Ω 5% 0.5W
3751	4822 116 52224	470Ω 5% 0.5W
3752	4822 116 52184	18Ω 5% 0.5W
3753	4822 116 52224	470Ω 5% 0.5W

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ELECTRICAL PARTSLIST - MTF CASSETTE BOARD

3754	4822 116 52256	2k2 5% 0.5W
3755	4822 116 52256	2k2 5% 0.5W
3756	4822 116 52256	2k2 5% 0.5W
3757	4822 116 52256	2k2 5% 0.5W
3759	4822 052 10478	4Ω7 5% 0.33W
3760	4822 116 52263	2k7 5% 0.5W
3761	4822 116 52284	47k 5% 0.5W
3762	4822 116 83874	220k 5% 0.5W
3764	4822 116 83864	10k 5% 0.5W
3765	4822 116 83864	10k 5% 0.5W
3766	4822 116 83864	10k 5% 0.5W
3767	4822 116 83864	10k 5% 0.5W
3768	4822 116 83864	10k 5% 0.5W
3769	4822 116 52303	8k2 5% 0.5W
3770	4822 116 52284	47k 5% 0.5W
3771	4822 116 83864	10k 5% 0.5W
3772	4822 116 52234	100k 5% 0.5W
3773	4822 116 83864	10k 5% 0.5W
3774	4822 116 52303	8k2 5% 0.5W
3775	4822 116 52284	47k 5% 0.5W
3776	4822 116 52234	100k 5% 0.5W
3777	4822 116 52284	47k 5% 0.5W
3778	4822 116 52234	100k 5% 0.5W
3779	4822 116 83864	10k 5% 0.5W
3780	4822 116 52245	150k 5% 0.5W
3781	4822 116 52175	100Ω 5% 0.5W
3782	4822 116 52175	100Ω 5% 0.5W
3783	4822 116 83864	10k 5% 0.5W
3784	4822 116 83864	10k 5% 0.5W
3785	4822 116 52217	270Ω 5% 0.5W
3786	4822 116 52234	100k 5% 0.5W
3787	4822 116 52175	100Ω 5% 0.5W
3788	4822 116 52256	2k2 5% 0.5W
3789	4822 116 52256	2k2 5% 0.5W

COIL

5701	4822 157 10371	100KHZ OSC COIL

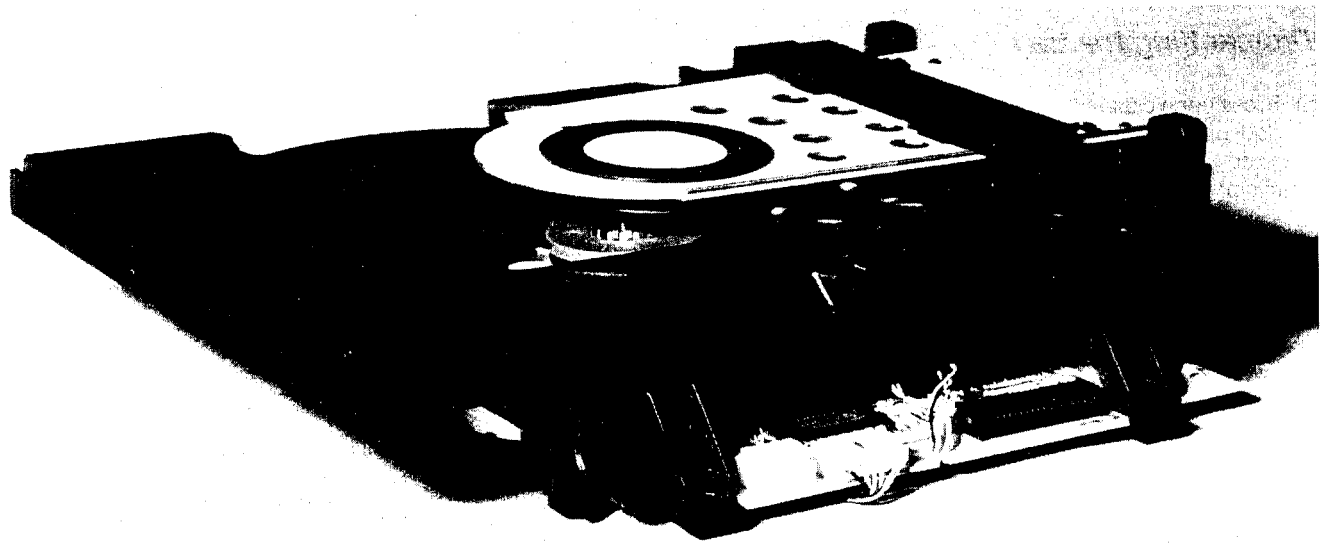
DIODES

6703	4822 130 30621	1N4148
6705	5322 130 34563	BZX79-C2V7
6706	4822 130 30621	1N4148
6708	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6709	4822 130 30621	1N4148
6710	4822 130 34173	BZX79-C5V6
6711	4822 130 34173	BZX79-C5V6

TRANSISTORS

7701	4822 130 42231	BC557C
7702	4822 130 40938	BC548
7704	4822 130 40981	BC337-25
7709	4822 130 44503	BC547C
7710	4822 130 44503	BC547C
7711	4822 209 32918	AN7318S
7712	4822 209 32918	AN7318S
7713	4822 130 40981	BC337-25
7714	4822 130 40981	BC337-25
7715	4822 130 40981	BC337-25
7716	4822 130 40981	BC337-25
7717	4822 130 40938	BC548
7718	4822 130 40959	BC547B
7719	4822 130 40959	BC547B
7720	4822 130 44503	BC547C
7721	4822 130 44503	BC547C

Note : Only the parts mentioned in this list are normal service spare parts.



ECO SHORT LOADER UNIT

for Systems

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Dismantling hints CD Short Loader

Dismantling the tray

a) Press open/close button to open the tray. If the tray doesn´t work, use a small screwdriver as shown in Fig.1 point 1 to move the tray outside. After the first centimetre it is possible to pull the tray out by hand.

b) Release two snaps and remove tray.

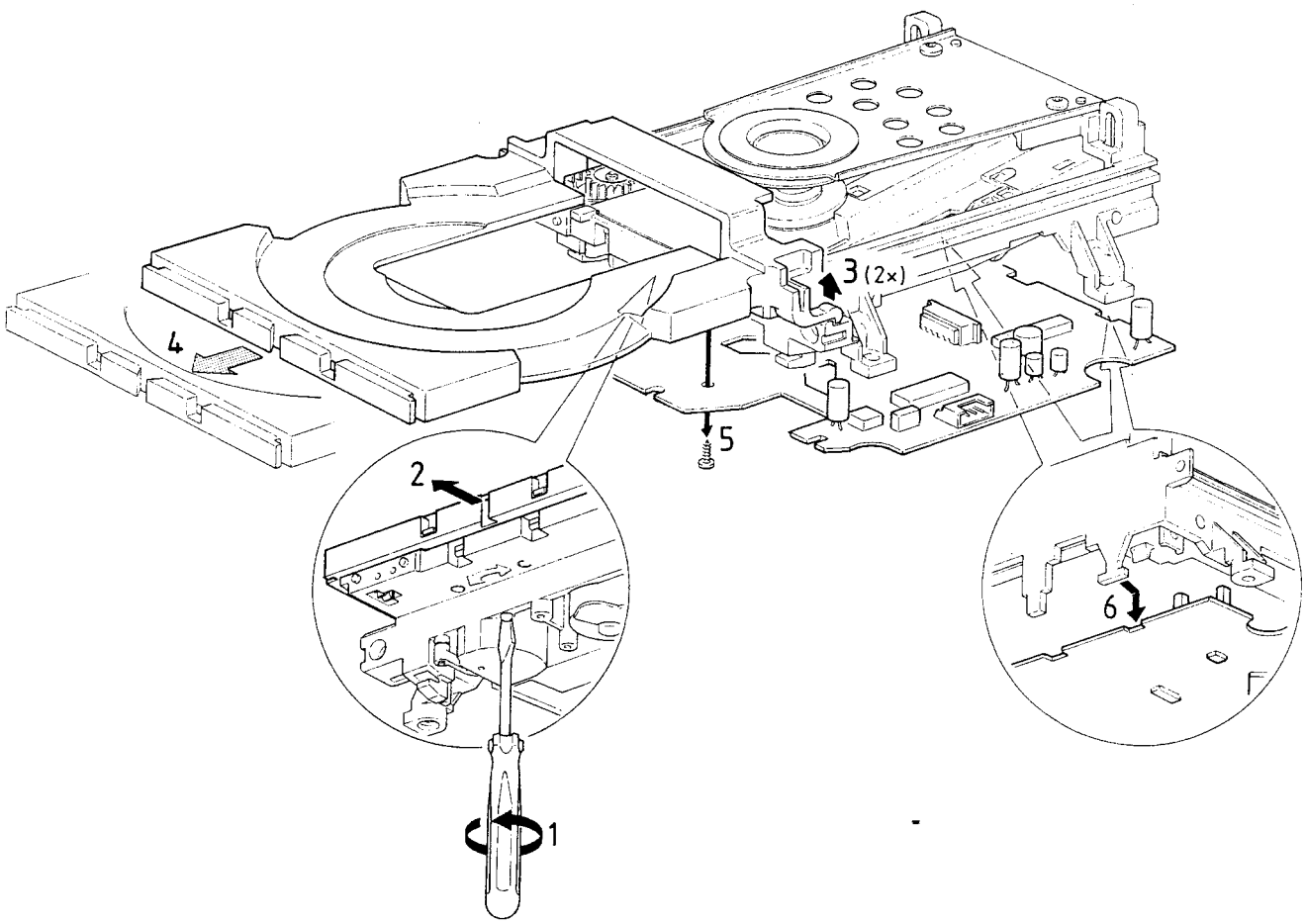


Fig. 1

Assembly of gear

a) Use a pin (e.g. a paperclip) to align the cam wheel (a) withthe gear wheel (b). See Fig. 2.

b) Fix the wheels with the small plastic whashers.

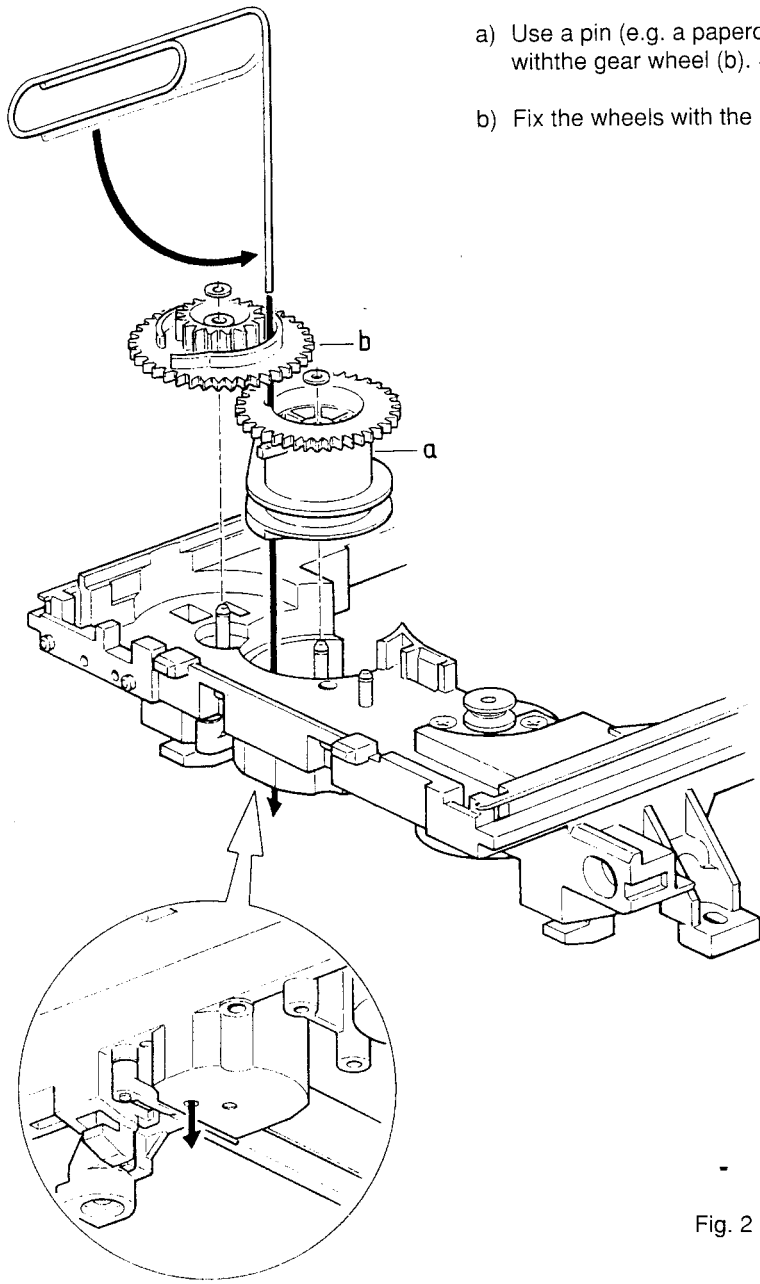


Fig. 2

c) Mount idle wheel 2 (c) and idle wheel 1 (d) in any position. See Fig. 3.

d) Fix the idle wheel 1 (d) with the small plastic whasher.

e) Mount the driving belt.

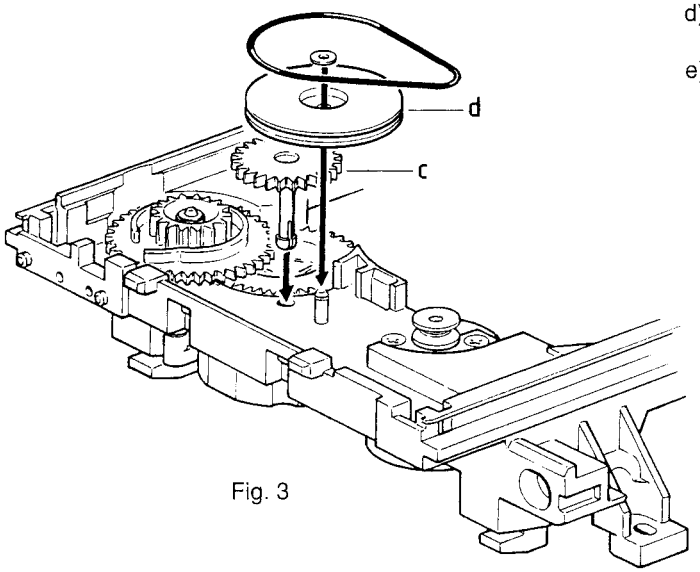


Fig. 3

f) Mount the pinion guiding assy and the cover as shown in Fig. 4.

g) Turn the gear wheel (b) counter clockwise to endposition.

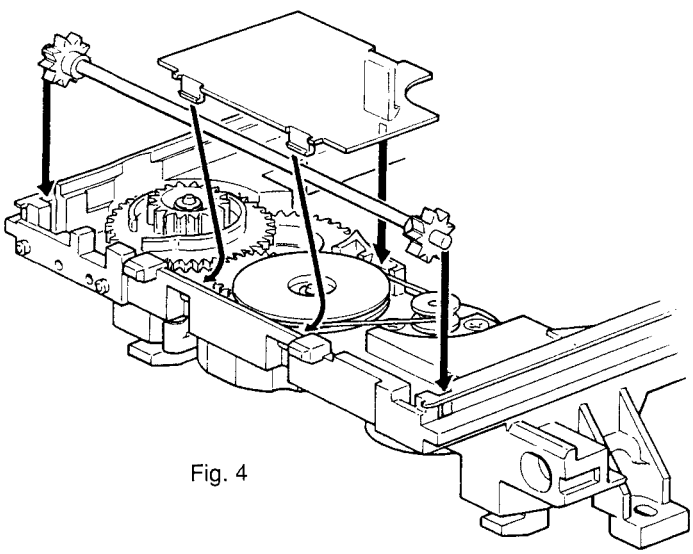


Fig. 4

h) Mount the CD Mechanism as shown in Fig. 5.

i) Mount the tray (Align the tray to the chassis and push it inside).

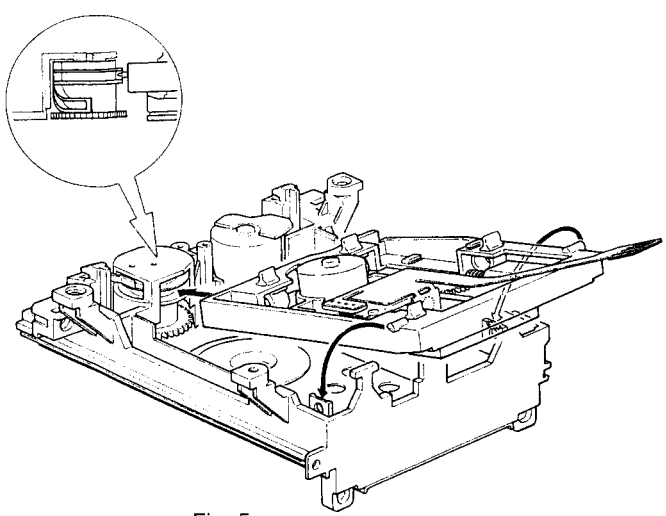


Fig. 5

Check if tray mechanism works correctly!

1) Turn the gear wheel (b) clockwise to its endposition (Use a small screwdriver as shown in Fig. 1 point 1).

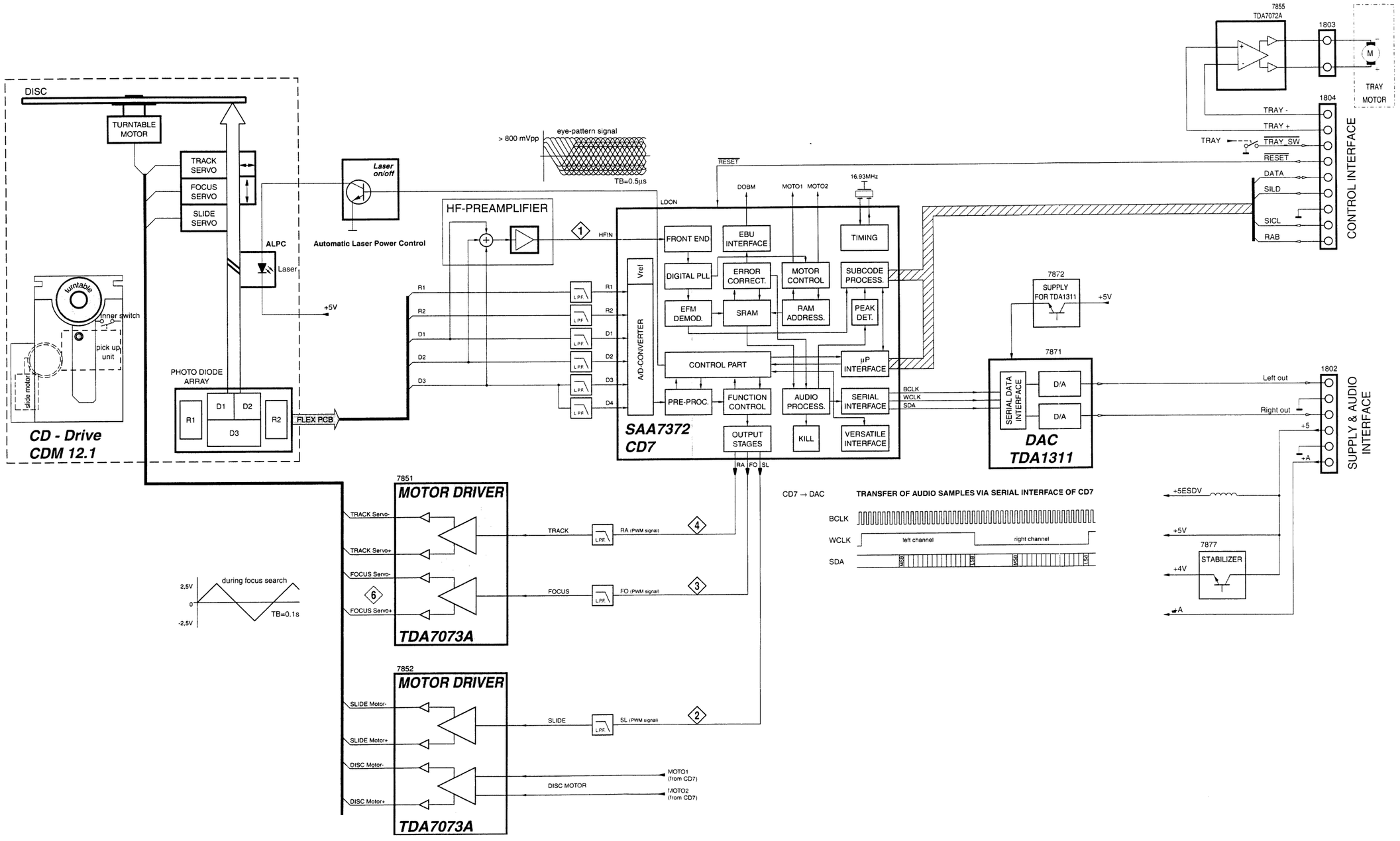
   The tray has to move to inner position first and then the CD mechanism has to move to its upper position.

2) Turn the gear wheel (b) counter clockwise to its endposition.

   The CD Mechanism has to move to its lower position first and then the tray has to move outside.

10-5

Functional Diagram *ECO Short Loader with CD7*



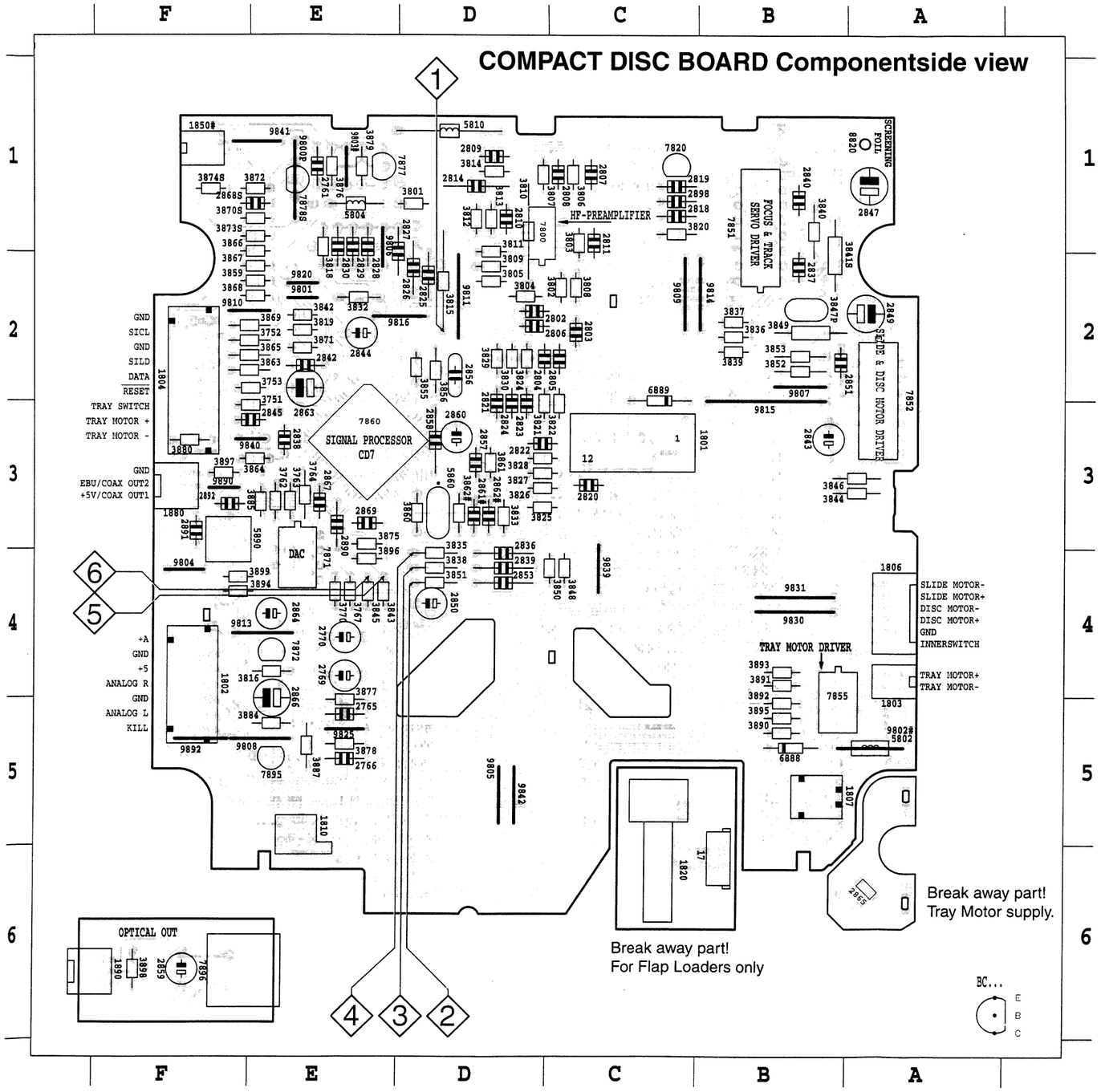
Abbreviations CD Part

SAA7372 - DECORDER AND DIGITAL SERVO IC CD7

Pin	Name	Direction	Description
1	VSSA1	GND	supply (analog) of CD7
2	VDDA1	+4V	supply (analog) of CD7
3	D1	HF-preamp → CD7	unipolar current input (central diode signal input)
4	D2	HF-preamp → CD7	unipolar current input (central diode signal input)
5	D3	HF-preamp → CD7	unipolar current input (central diode signal input)
6	VRL	GND	reference input for ADC
7	D4	HF-preamp → CD7	unipolar current input (central diode signal input)
8	R1	HF-preamp → CD7	unipolar current input (central diode signal input)
9	R2	HF-preamp → CD7	unipolar current input (central diode signal input)
10	IRET	→ CD7	current reference for calibration ADC
11	VRH	not connected	reference output from ADC
12	VSSA2	GND	supply (analog) of CD7
13	SELPLL	+4V	selects whether internal clock multiplier PLL is used
14	ISLICE	CD7 →	current feedback from data slicer
15	HFIN	→ CD7	comparator signal input
16	VSSA3	GND	supply (analog) of CD7
17	HFREF	→ CD7	comparator common mode input
18	IREF	→ CD7	reference current pin (nom. VDD/2)
19	VDDA2	+4V	supply (analog) of CD7
20	TEST 1	GND	test control input
21	CRIN	X-Tal → CD7	crystal/resonator input
22	CDOUT	X-Tal → CD7	crystal/resonator output
23	TEST 2	GND	test control input
24	CL16	not connected	16.9344MHz system clock output
25	CL11	not connected	11.2896MHz to 5.6448MHz clock output (3-state)
26	RA	CD7 → servo driver	radial actuator output
27	FO	CD7 → servo driver	focus actuator output
28	SL	CD7 → servo driver	slide actuator output
29	TEST3	GND	test control input
30	VDD1P	+4V	supply (digital) of CD7
31	DOBM	CD7 → digital output	bi-phase mark output (3-state)
32	VSS1	GND	supply (digital) of CD7
33	MOTO1	CD7 → servo driver	motor output1 of CD7; versatile (3-state)
34	MOTO2	CD7 → servo driver	motor output2 of CD7; versatile (3-state)
35	SBSY	not connected	subcode block sync (3-state)
36	SFSY	not connected	subcode frame sync (3-state)
37	RCK	GND	subcode clock input
38	SUB	not connected	P to W subcode bits (3-state)
39	VSS2	GND	supply (digital) of CD7
40	V5	not connected	versatile output pin of CD7
41	V4	not connected	versatile output pin of CD7
42	V3	not connected	versatile output pin of CD7 (open drain)
43	KILL	CD7 →	kill output; programmable (open drain)
44	MISC	not connected	C2 error flag; output only defined in CD-ROM modes (3-state)
45	DATA	CD7 → DAC	serial data output (3-state)
46	WCLK	CD7 → DAC	word clock output (3-state)
47	VDD2P	+4V	supply (digital) of CD7
48	BCLK	CD7 → DAC	serial bit clock output (3-state)
49	VSS3	GND	supply (digital) of CD7
50	CL4	not connected	4.2336MHz µP clock output
51	SDA	µP → CD7	µP interface data I/O line (open drain output)
52	SCL	µP → CD7	µP interface clock line
53	RAB	µP → CD7	µP interface R/W and load control line
54	SILD	µP → CD7	µP interface R/W and load control line
55	NC		no connection
56	VSS4	GND	supply (digital) of CD7
57	RESET	µP → CD7	power-on reset input (active low)
58	STATUS	not connected	servo interupt request line /CD7 status register output (opendrain)
59	VDD3C	+4V	supply core (digital)
60	C2FAIL	not connected	indication of correction failure (open drain)
61	CFLG	not connected	correction falg output (open drain)
62	V1	→ CD7	verstaile input pin
63	V2	→ CD7	verstaile input pin
64	LDON	CD7 → 7820	laser drive on output (open drain)

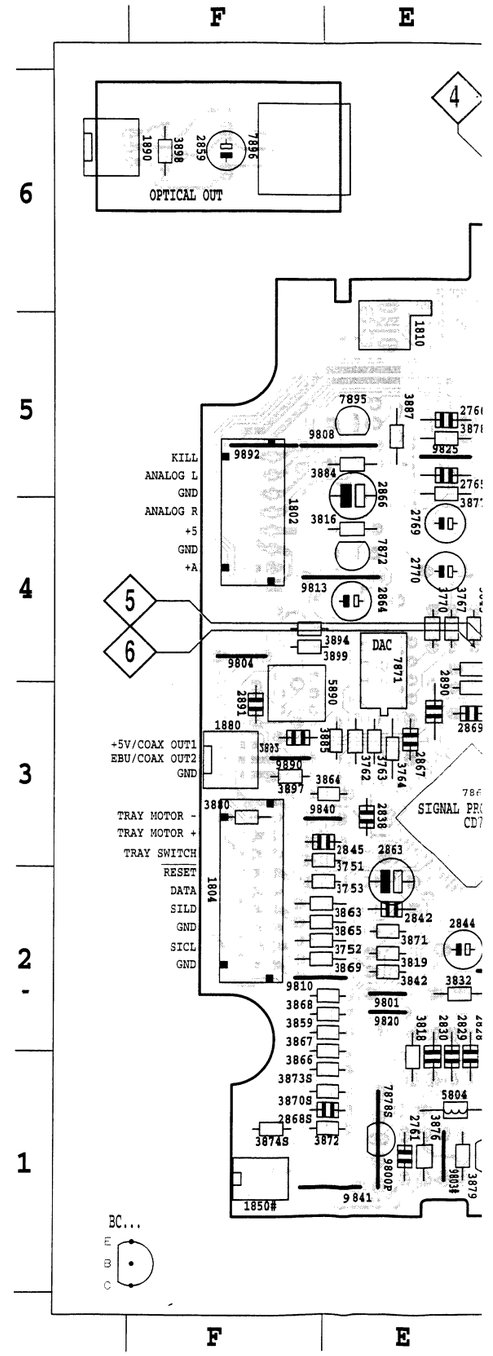
10-6

COMPACT DISC BOARD Componentside view

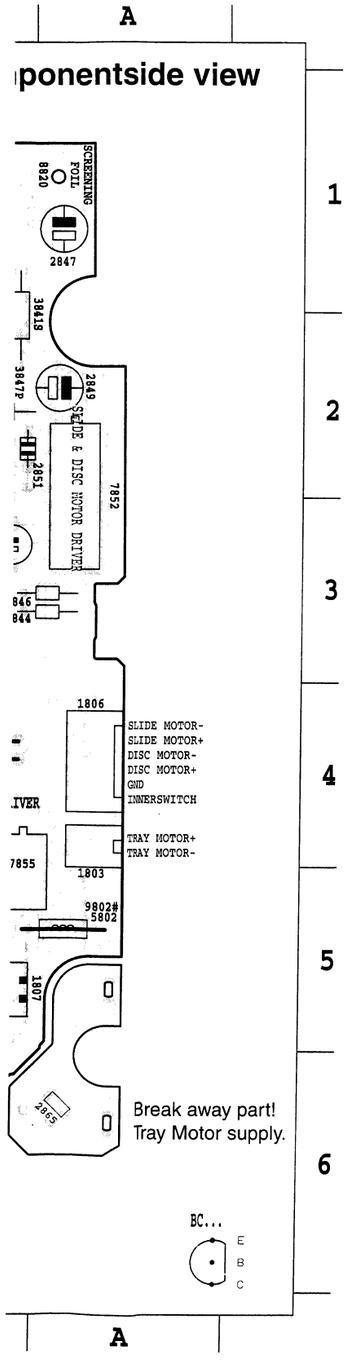


17	B6	3751	F3	3873S	E1
1801	C3	3752	F2	3874S	F1
1802	F4	3753	F2	3875	E3
1803	A4	3762	E3	3876	E1
1804	F2	3763	E3	3877	E5
1806	A4	3764	E3	3878	E5
1807	B5	3767	E4	3879	E1
1810	E5	3770	E4	3880	F3
1820	C5	3801	D1	3884	E5
1850#	F1	3802	C2	3885	E3
1880	F3	3803	C1	3887	E5
1890	F6	3804	D2	3888	F6
2761	E1	3805	D2	3890	B5
2765	E5	3806	C1	3891	B4
2766	E5	3807	D1	3892	B5
2769	E4	3808	C2	3893	B4
2770	E4	3809	D2	3894	F4
2802	D2	3810	D1	3895	B5
2803	C2	3811	D1	3896	E4
2804	D2	3812	D1	3897	F3
2805	C2	3813	D1	3898	F6
2806	D2	3814	D1	3899	F4
2807	C1	3815	D2	5802	A5
2808	C1	3816	E4	5804	E1
2809	D1	3818	E1	5810	D1
2810	D1	3819	E2	5860	D3
2811	C1	3820	C1	5890	F3
2814	D1	3821	D3	6888	B5
2818	C1	3822	C3	6889	C2
2819	C1	3824	D2	7800	D1
2820	C3	3825	D3	7820	C1
2821	D3	3826	D3	7851	B1
2822	D3	3827	D3	7852	A2
2823	D3	3828	D3	7855	B5
2824	D3	3829	D2	7860	E3
2825	D2	3830	D2	7871	E4
2826	D2	3832	E2	7872	E4
2827	E1	3833	D3	7877	E1
2828	E1	3835	D4	7878S	E1
2829	E1	3836	B2	7895	E5
2830	E1	3837	B2	7896	F6
2836	D4	3838	D4	9800P	E1
2837	B2	3839	B2	9801	E2
2838	E3	3840	B1	9803#	E1
2839	D4	3842	E2	9804	F4
2840	B1	3841S	B2	9805	D5
2842	E2	3843	E4	9806	E1
2843	B3	3844	A3	9802#	A5
2844	E2	3845	E4	9807	B2
2845	F3	3846	A3	9808	E5
2847	A1	3848	C4	9809	C2
2849	A2	3847P	B2	9810	F2
2850	D4	3849	B2	9811	D2
2851	B2	3850	C4	9813	E4
2853	D4	3851	D4	9814	B2
2856	D2	3852	B2	9815	B2
2857	D3	3853	B2	9816	E2
2858	D3	3855	D2	9820	E2
2859	F6	3856	D2	9825	E5
2860	D3	3859	E2	9830	B4
2863	E2	3860	D3	9831	B4
2861#	D3	3861	D3	9839	C4
2864	E4	3863	F2	9840	F3
2865	A6	3864	E3	9841	E1
2862#	D3	3862#	D3	9842	D5
2866	E5	3865	F2	9890	F3
2867	E3	3866	E1	9892	F5
2868S	E1	3867	E2		
2869	E3	3868	E2	S = for Systems	
2890	E3	3869	F2	P = for Portables	
2891	F3	3870S	E1	# = provisional	
2892	F3	3871	E2		
2898	C1	3872	E1		

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.



10-6



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2761	E1	3805	D2	3890	B5
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2804	D2	3812	D1	3897	F3
2805	C2	3813	D1	3898	F6
2806	D2	3814	D1	3899	F4
2807	C1	3815	D2	5802	A5
2808	C1	3816	E4	5804	E1
2809	D1	3818	E1	5810	D1
2810	D1	3819	E2	5860	D3
2811	C1	3820	C1	5890	F3
2814	D1	3821	D3	6888	B5
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2836	D4	3838	D4	9800P	E1
2837	B2	3839	B2	9801	E2
2838	E3	3840	B1	9803#	E1
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2840	B1	3841S	B2	9805	D5
2842	E2	3843	E4	9806	E1
2843	B3	3844	A3	9802#	A5
2844	E2	3845	E4	9807	B2
2845	F3	3846	A3	9808	E5
2847	A1	3848	C4	9809	C2
2849	A2	3847P	B2	9810	F2
2850	D4	3849	B2	9811	D2
2851	B2	3850	C4	9813	E4
2853	D4	3851	D4	9814	B2
2856	D2	3852	B2	9815	B2
2857	D3	3853	B2	9816	E2
2858	D3	3855	D2	9820	E2
2859	F6	3856	D2	9825	E5
2860	D3	3859	E2	9830	B4
2863	E2	3860	D3	9831	B4
2861#	D3	3861	D3	9839	C4
2864	E4	3863	F2	9840	F3
2865	A6	3864	E3	9841	E1
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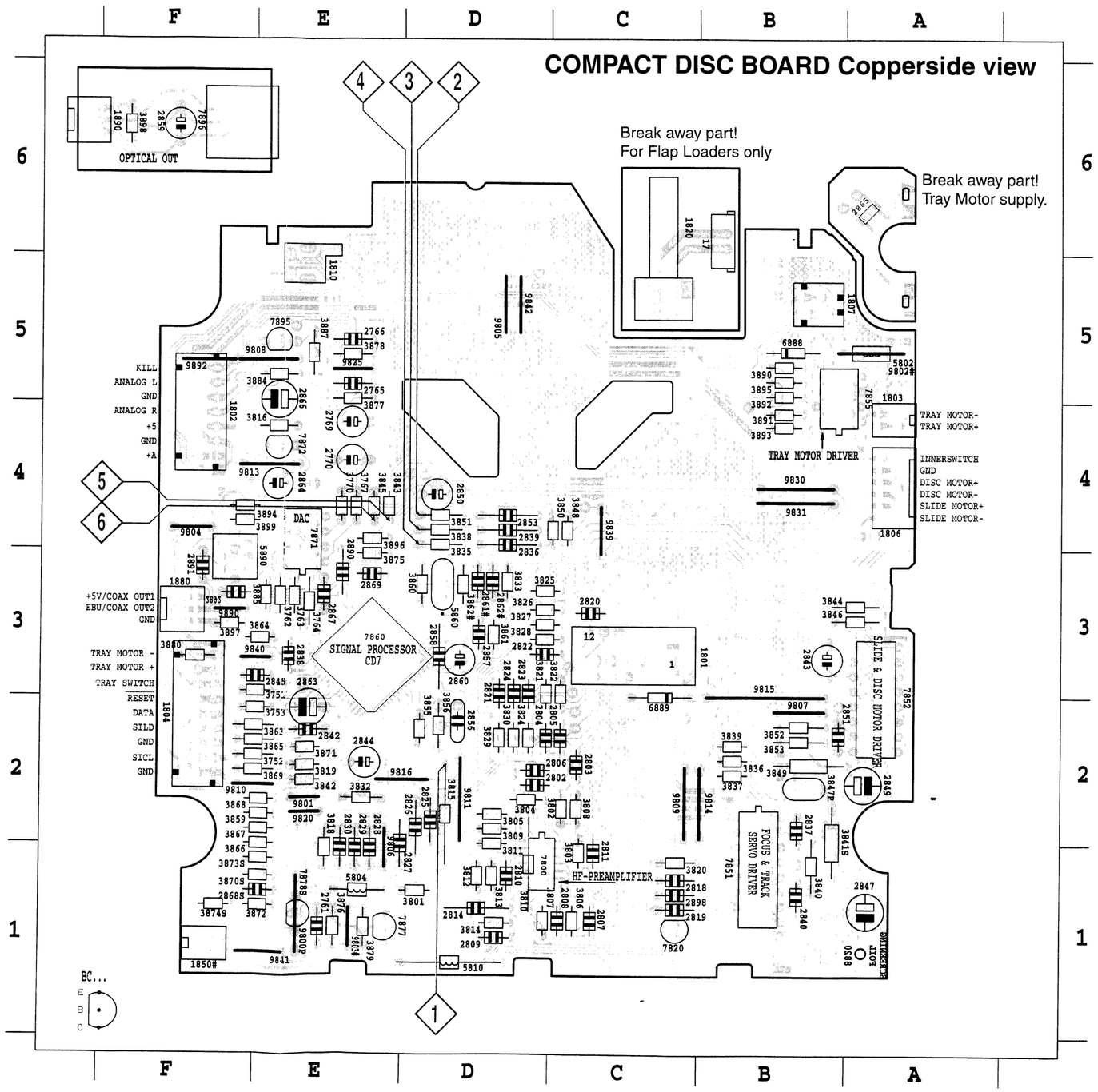


10-7

CD Board

CDM12.1

HF-Amplifier

eye-pattern

LASER SWITCH

SERVO-DRIVER 7851 TDA7073A

MOTOR-DRIVER 7852 TDA7073A

MICROPROCESSOR INTERFACE

CONTROL PART

VERSATILE PINS

SERIAL DATA INTERFACE

AUDIO PROCESSOR

PEAK DETECT

SUBCODE PROCESSOR

PRE-PROC.

FUNCTION CONTROL

ERROR CORRECTION

FLAGS

EBU INT.

EFM DEMOD.

SRAM

RAM ADDR.

DIGITAL PLL

MOTOR CONTROL

TIMING

OUTPUT STAGES

FRONT END

ADC

Vref

KILL

during speed up

during play

during brake

10-7

eye-pattern

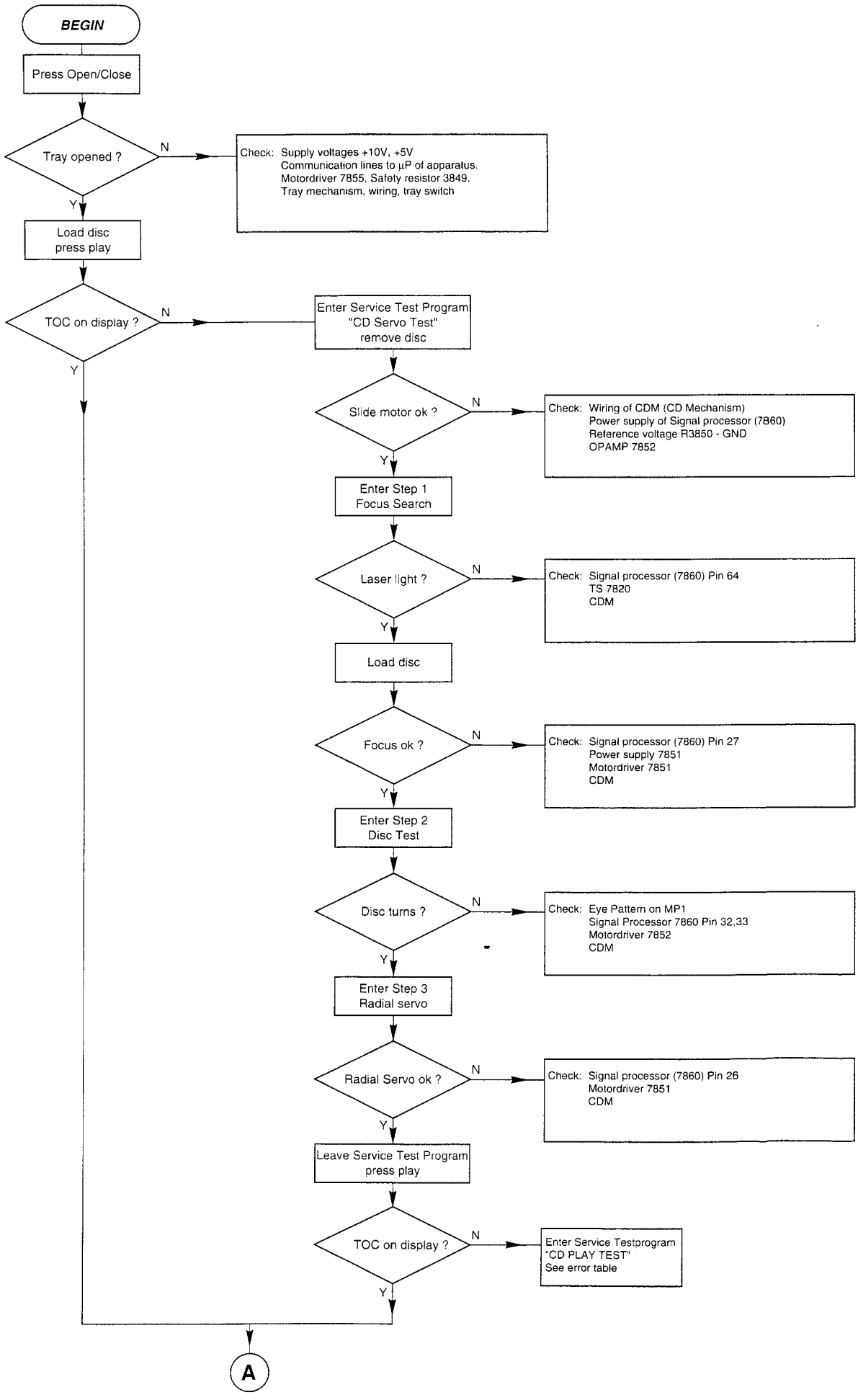
LASER SWITCH

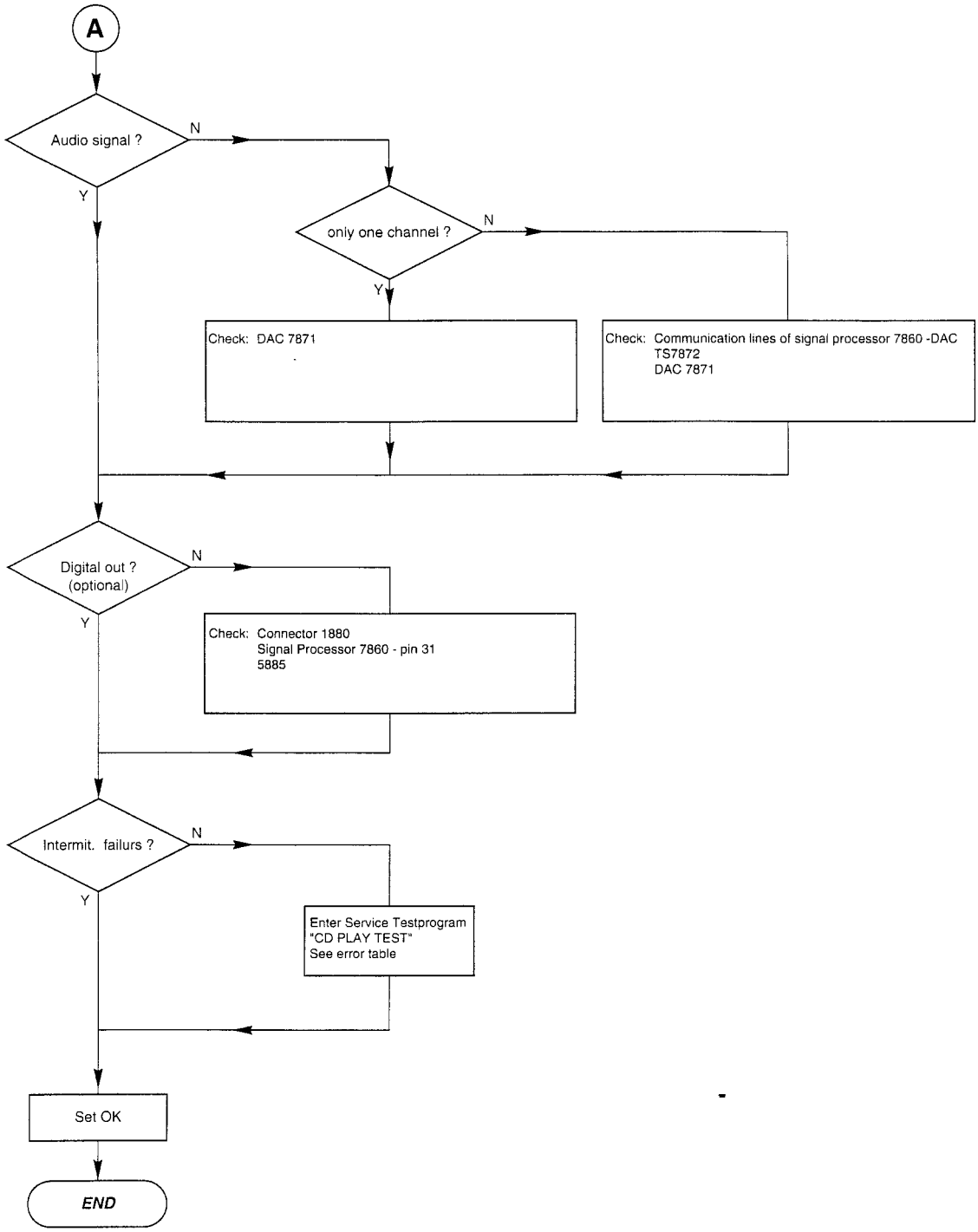
TRANSFER OF AUDIO SAMPLES VIA SERIAL INTERFACE OF CD7

during speed up

during play

during brake


BEGIN
Press Open/Close
Tray opened ?
N
Check: Supply voltages +10V, +5V
Communication lines to µP of apparatus.
Motordriver 7855, Safety resistor 3849.
Tray mechanism, wiring, tray switch
Y
Load disc
press play
TOC on display ?
N
Enter Service Test Program
"CD Servo Test"
remove disc
Y
Slide motor ok ?
N
Check: Wiring of CDM (CD Mechanism)
Power supply of Signal processor (7860)
Reference voltage R3850 - GND
OPAMP 7852
Y
Enter Step 1
Focus Search
Laser light ?
N
Check: Signal processor (7860) Pin 64
TS 7820
CDM
Y
Load disc
Focus ok ?
N
Check: Signal processor (7860) Pin 27
Power supply 7851
Motordriver 7851
CDM
Y
Enter Step 2
Disc Test
Disc turns ?
N
Check: Eye Pattern on MP1
Signal Processor 7860 Pin 32,33
Motordriver 7852
CDM
Y
Enter Step 3
Radial servo
Radial Servo ok ?
N
Check: Signal processor (7860) Pin 26
Motordriver 7851
CDM
Y
Leave Service Test Program
press play
TOC on display ?
N
Enter Service Testprogram
"CD PLAY TEST"
See error table
Y
A


A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
Check: Communication lines of signal processor 7860 -DAC
TS7872
DAC 7871
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 31
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CDM-ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CDM flexfoil from printed board
2. Connect paperclip to CDM flexfoil to short-circuit flexfoil (fig. 1)
3. Short-circuit printed board with brass-sheet (4822 321 11197) plugged into the flexfoil connector (fig. 2)
4. Remove old CDM mechanism
5. Position new CDM mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove shor-circuit from flexfoil of new CDM
8. Connect new flexfoil to print connector (fig. 3)

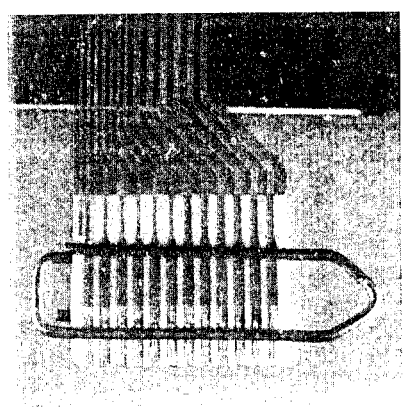


Fig. 1

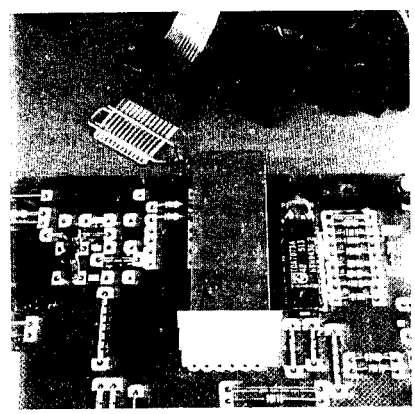


Fig. 2

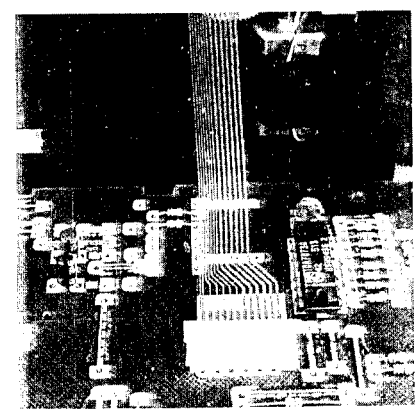
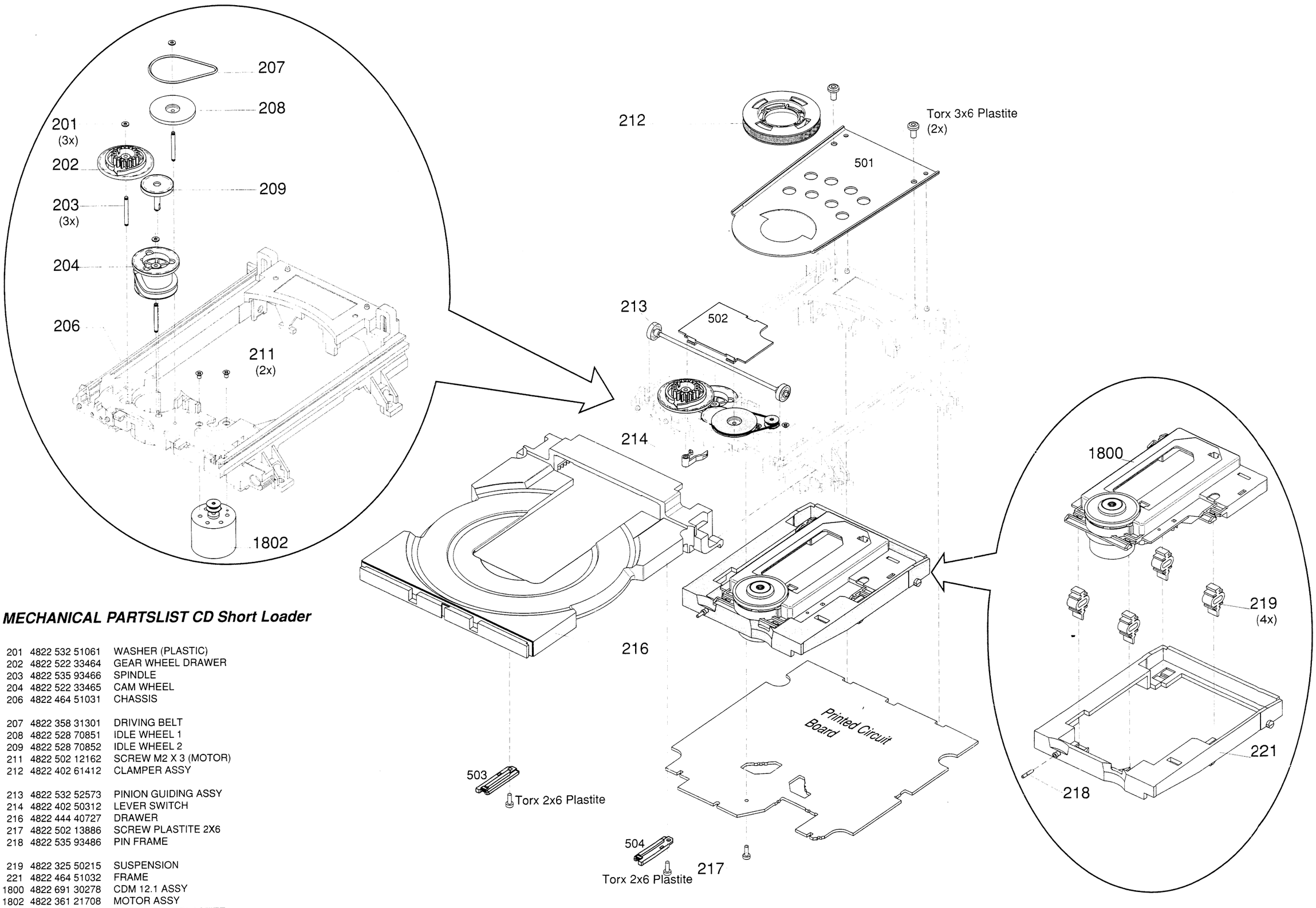


Fig. 3

10-9

Exploded view CD Short Loader



MECHANICAL PARTSLIST CD Short Loader

201	4822 532 51061	WASHER (PLASTIC)
202	4822 522 33464	GEAR WHEEL DRAWER
203	4822 535 93466	SPINDLE
204	4822 522 33465	CAM WHEEL
206	4822 464 51031	CHASSIS
207	4822 358 31301	DRIVING BELT
208	4822 528 70851	IDLE WHEEL 1
209	4822 528 70852	IDLE WHEEL 2
211	4822 502 12162	SCREW M2 X 3 (MOTOR)
212	4822 402 61412	CLAMPER ASSY
213	4822 532 52573	PINION GUIDING ASSY
214	4822 402 50312	LEVER SWITCH
216	4822 444 40727	DRAWER
217	4822 502 13886	SCREW PLASTITE 2X6
218	4822 535 93486	PIN FRAME
219	4822 325 50215	SUSPENSION
221	4822 464 51032	FRAME
1800	4822 691 30278	CDM 12.1 ASSY
1802	4822 361 21708	MOTOR ASSY
	4822 502 30735	SCREW 3 X 6 PLASTITE

ELECTRICAL PARTS LIST - CD BOARD

MISCELLANEOUS

1801	4822 267 51453	Flex foil connector 12 pin
1804	5322 265 40945	Connector 9pin
1810	4822 276 13503	Tray Switch

CAPACITORS

2761	4822 121 51387	10nF 20% 16V
2765	4822 126 12878	1,5nF 10% 16V
2766	4822 126 12878	1,5nF 10% 16V
2769	4822 124 41969	1µF 20% 50V
2770	4822 124 23401	4,7µF 20% 25V
2802	4822 126 12882	100nF 20% 50V
2803	4822 122 10319	82pF 5% 50V
2804	4822 122 10319	82pF 5% 50V
2805	4822 122 33849	150pF 10% 50V
2806	4822 122 33192	27pF 5% 50V
2807	4822 122 33848	47pF 5% 50V
2808	4822 122 33848	47pF 5% 50V
2809	4822 122 33848	47pF 5% 50V
2810	4822 122 10462	15pF 5% 50V
2811	4822 122 33849	150pF 10% 50V
2814	4822 126 12339	2,2nF 10% 16V
2818	4822 126 12882	100nF 20% 50V
2819	4822 126 12882	100nF 20% 50V
2820	4822 122 10459	560pF 10% 50V
2821	4822 126 10053	180pF 10% 50V
2822	4822 126 12787	330pF 10% 50V
2823	4822 126 12878	1,5nF 10% 16V
2824	4822 126 10053	180pF 10% 50V
2825	4822 122 10466	220pF 10% 50V
2826	4822 122 10466	220pF 10% 50V
2827	4822 122 10466	220pF 10% 50V
2828	4822 122 10466	220pF 10% 50V
2829	4822 122 10466	220pF 10% 50V
2830	4822 122 10466	220pF 10% 50V
2836	4822 126 13098	5,6nF 20% 16V
2837	4822 122 10459	560pF 10% 50V
2838	4822 126 12882	100nF 20% 50V
2839	4822 121 51387	10nF 20% 16V
2840	4822 122 10576	1,8nF 10% 16V
2842	4822 121 51387	10nF 20% 16V
2843	5322 124 41948	0,47µF 20% 50V
2844	4822 124 23401	4,7µF 20% 25V
2845	4822 122 33848	47pF 5% 50V
2847	4822 124 40433	47µF 20% 25V
2849	4822 124 40433	47µF 20% 25V
2850	4822 124 23178	47µF 20% 16V
2851	4822 121 51387	10nF 20% 16V
2853	4822 126 12882	100nF 20% 50V
2856	4822 121 43526	47nF 5% 100V
2857	4822 126 11585	22nF 20% 50V
2858	4822 122 33848	47pF 5% 50V
2860	4822 124 23401	4.7µF 20% 25V
2863	4822 124 23178	47µF 20% 16V
2864	4822 124 23401	4.7µF 20% 25V
2866	4822 124 23264	100µF 20% 6,3V
2898	4822 121 51387	10nF 10% 16V
2869	4822 126 12882	100nF 20% 50V
2898	4822 126 12882	100nF 20% 50V

RESISTORS

3751	4822 116 83872	220R 5% 0,5W
3752	4822 116 83872	220R 5% 0,5W
3753	4822 116 83872	220R 5% 0,5W
3762	4822 050 11002	1K 5% 0,2W
3763	4822 050 11002	1K 5% 0,2W
3764	4822 050 11002	1K 5% 0,2W
3767	4822 116 52224	470R 5% 0,5W
3770	4822 116 52224	470R 5% 0,5W
3801	4822 116 52226	560R 5% 0,5W
3802	4822 050 11002	1K 5% 0,2W
3803	4822 116 52272	330K 5% 0,5W
3804	4822 116 83961	6,8K 5% 0,16W
3805	4822 116 52257	22K 5% 0,5W
3806	4822 116 83864	10K 5% 0,5W
3807	4822 116 83864	10K 5% 0,5W
3808	4822 116 52284	47K 5% 0,5W
3809	4822 116 52269	3,3K 5% 0,5W
3810	4822 116 52269	3,3K 5% 0,5W
3811	4822 116 52257	22K 5% 0,5W
3812	4822 116 52269	3,3K 5% 0,5W
3813	4822 116 52269	3,3K 5% 0,5W
3814	4822 116 52269	3,3K 5% 0,5W
3815	4822 050 11002	1K 5% 0,2W
3816	4822 116 52283	4,7K 5% 0,5W
3818	4822 116 52283	4,7K 5% 0,5W
3819	4822 116 83868	150R 5% 0,5W
3820	4822 050 11002	1K 5% 0,2W
3821	4822 116 52239	120k 5% 0,5W
3822	4822 116 52291	56k 5% 0,5W
3824	4822 116 52239	120k 5% 0,5W
3825	4822 116 83864	10k 5% 0,5W
3826	4822 116 83864	10k 5% 0,5W
3827	4822 116 83864	10k 5% 0,5W
3828	4822 116 83864	10k 5% 0,5W
3829	4822 116 83864	10k 5% 0,5W
3830	4822 116 83864	10k 5% 0,5W
3832	4822 116 52191	33R 5% 0,5W
3833	4822 050 11002	1K 5% 0,2W
3835	4822 116 52264	27K 5% 0,5W
3836	4822 116 52207	1,2K 5% 0,5W
3837	4822 116 83961	6,8K 5% 0,16W
3838	4822 116 52257	22K 5% 0,5W
3839	4822 116 52207	1,2K 5% 0,5W
3840	4822 116 83961	6,8K 5% 0,16W
3841	4822 052 10338	3,3R NFR25
3842	4822 116 83864	10K 5% 0,5W
3843	4822 116 83882	39K 5% 0,5W
3844	4822 050 11002	1K 5% 0,2W
3845	4822 116 83882	39K 5% 0,5W
3846	4822 050 11002	1K 5% 0,2W

10-10

ELECTRICAL PARTS LIST - CD BOARD

3848	4822 050 11002	1K 5% 0,2W
3849	4822 052 10338	3,3R NFR25
3850	4822 050 11002	1K 5% 0,2W
3851	4822 116 52264	27K 5% 0,5W
3852	4822 050 11002	1K 5% 0,2W
3853	4822 116 83961	6,8K 5% 0,16W
3855	4822 116 52278	390K 5% 0,5W
3856	4822 051 20154	150K 5% 0,5W
3859	4822 116 52257	22K 5% 0,5W
3860	4822 116 52175	100R 5% 0,5W
3861	4822 116 52175	100R 5% 0,5W
3862	4822 116 52235	1M 5% 0,5W
3863	4822 116 83872	220R 5% 0,5W
3864	4822 116 52175	100R 5% 0,5W
3865	4822 116 83872	220R 5% 0,5W
3866	4822 116 83864	10K 5% 0,5W
3867	4822 116 83864	10K 5% 0,5W
3868	4822 116 83864	10K 5% 0,5W
3869	4822 116 83864	10K 5% 0,5W
3870	4822 116 83864	10K 5% 0,5W
3871	4822 116 52176	10R 5% 0,5W
3872	4822 116 52175	100R 5% 0,5W
3873	4822 116 83864	10K 5% 0,5W
3874	4822 116 83864	10K 5% 0,5W
3875	4822 116 52175	100R 5% 0,5W
3876	4822 116 52213	180R 5% 0,5W
3877	4822 116 52284	47K 5% 0,5W
3878	4822 116 52284	47K 5% 0,5W
3879	4822 116 52226	560R 5% 0,5W
3890	4822 050 11002	1K 5% 0,2W
3891	4822 050 11002	1K 5% 0,2W
3892	4822 116 52271	33K 5% 0,16W
3893	4822 116 52249	1,8K 5% 0,16W
3895	4822 116 52271	33K 5% 0,16W

COILS

5804	4822 157 53302	1µH
5810	4822 152 20677	10µH
5860	4822 242 73557	Ceramic Res. 8,46MHz

DIODES

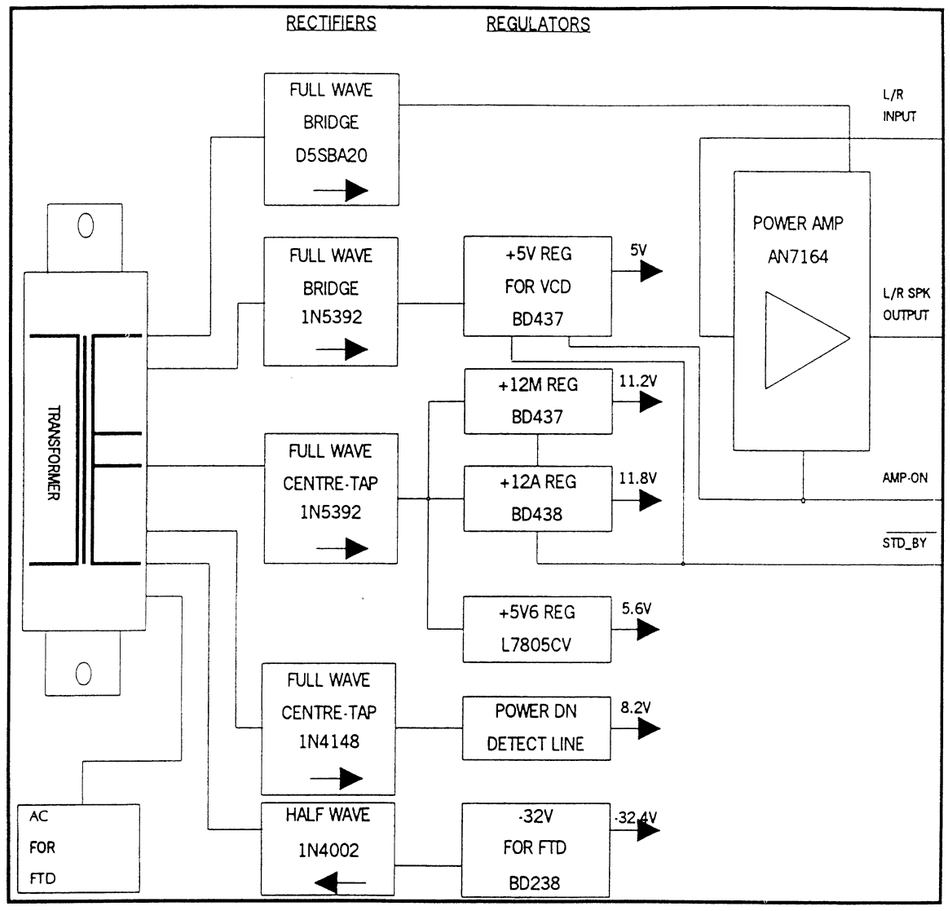
6888	4822 130 80655	BZX79-F2V4
6889	4822 130 34167	BZX79-B6V2

TRANSISTORS

7820	5322 209 11517	PC74HCU04T
7851	4822 209 32852	TDA7073A/N2
7852	4822 209 32852	TDA7073A/N2
7855	4822 209 31519	TDA7072A
7860	4822 209 12752	SAA7378GP
7871	4822 209 32421	TDA1311A/N2

Note : Only the parts mentioned in this list are normal service spare parts.

POWER BOARD



WARNING : *If the power amplifier heatsink is not attached to the power amplifier during testing, do not make the amplifier deliver more than 500mW per channel. It is advisable to inject signal one channel at a time whenever possible and to remove all input signal immediately after test.*

11 - 1

CONNECTOR 12 TO 1210

1	PA	AC input to power amplifier rectifier
2	PA	AC input to power amplifier rectifier *[Note:Pin1 is shorted to Pin 2]*
3	PA	AC input to power amplifier rectifier
4	PA	AC input to power amplifier rectifier *[Note:Pin 3 is shorted to Pin 4]*
5	+12V/+5V6	AC input to +12V & +5V6 rectifier
6	GND	Centre-tap of secondary winding of Pin 5 ,7 and 8
7	+12V/+5V6	AC input to +12V & +5V6 rectifier
8	-35V	AC input to FTD rectifier
9	FTD	FTD filament voltage
10	FTD	FTD filament voltage

CONNECTOR 1222 — FTD SUPPLY AND uP CONTROL SIGNALS

1	STDBY	Standby signal from microprocessor
2	~F1	AC voltage for FTD filament
3	~F2	AC voltage for FTD filament
4	-32V	-32.4V voltage for FTD grid
5	PWD DN	Power down signal to microprocessor

CONNECTOR 1223 — AF SIGNAL AND SUPPLY

1	L	Left input for power amplifier
2	⊥ a	AF ground
3	R	Right input for power amplifier
4	AMP_ON	Control from up to switch power amplifier and VCD regulator to standby
5	+12M	+12V for tapedeck motors and CD mechanisms
6	⊥ B	Ground for +12A
7	+12A	+12V for analog circuitries
8	⊥ D	Motor and Digital ground
9	+5V6	+5V6 for set uP and VCD uP

CONNECTOR 1224 — AF SIGNAL AND SUPPLY *[OPTION]*

[Connections as 1223 but with digital ground and motor ground seperated]

1	L	Left input for power amplifier
2	⊥ a	AF ground
3	R	Right input for power amplifier
4	AMP_ON	Control from uP to switch power amplifier and VCD regulator to standby
5	+12A	+12V for analog circuitries
6	⊥ B	Ground for +12A
7	+12M	+12V for tapedeck motors and CD mechanisms
8	⊥ M	Motor ground
9	+5V6	+5V6 for set up and VCD up
10	⊥ D	Digital ground

CONNECTOR 1237 — VCD SUPPLY *[OPTION]*

1	+VCD	+5V for VCD module
2	+VCD	+5V for VCD module
3	+Vsl	+5V for VCD uP-SRAM
4	GND	Ground
5	GND	Ground
6	+VA	+12V for VCD servo drivers

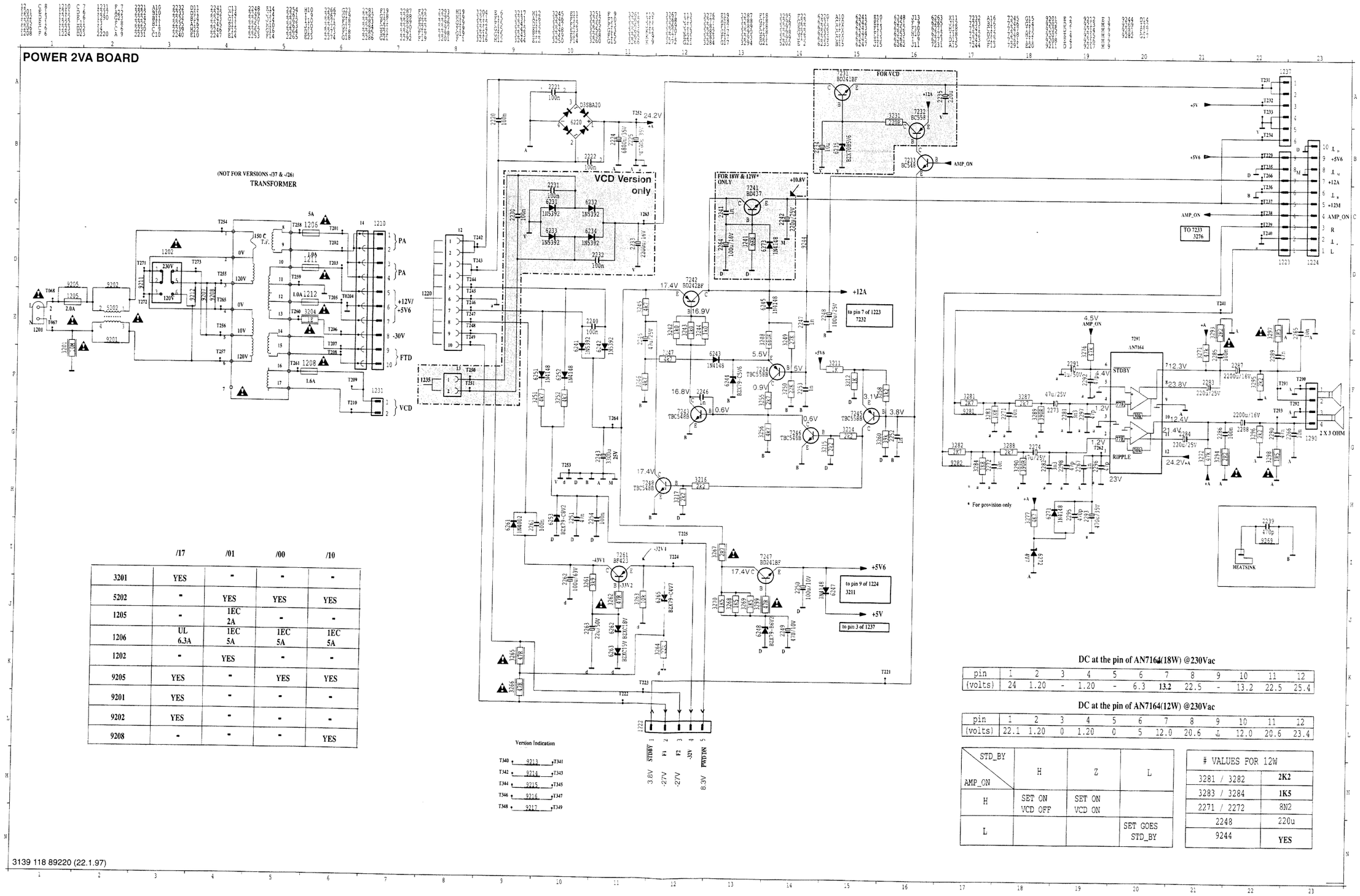
CONNECTOR 13 TO 1231 *[OPTION]*

1	VCD	AC input to VCD rectifier
2	VCD	AC input to VCD rectifier

11-2

POWER 2VA CIRCUIT

POWER 2VA BOARD



	/17	/01	/00	/10
3201	YES	-	-	-
5202	-	YES	YES	YES
1205	-	IEC 2A	-	-
1206	UL 6.3A	IEC 5A	IEC 5A	IEC 5A
1202	-	YES	-	-
9205	YES	-	YES	YES
9201	YES	-	-	-
9202	YES	-	-	-
9208	-	-	-	YES

DC at the pin of AN7164(18W) @230Vac

pin	1	2	3	4	5	6	7	8	9	10	11	12
(volts)	24	1.20	-	1.20	-	6.3	**13.2**	22.5	-	13.2	22.5	25.4

DC at the pin of AN7164(12W) @230Vac

pin	1	2	3	4	5	6	7	8	9	10	11	12
(volts)	22.1	1.20	0	1.20	0	5	12.0	20.6	L	12.0	20.6	23.4

STD_BY / AMP_ON	H	Z	L
H	SET ON VCD OFF	SET ON VCD ON	
L			SET GOES STD_BY

# VALUES FOR 12W	
3281 / 3282	2K2
3283 / 3284	1K5
2271 / 2272	8N2
2248	220u
9244	YES

3139 118 89220 (22.1.97)

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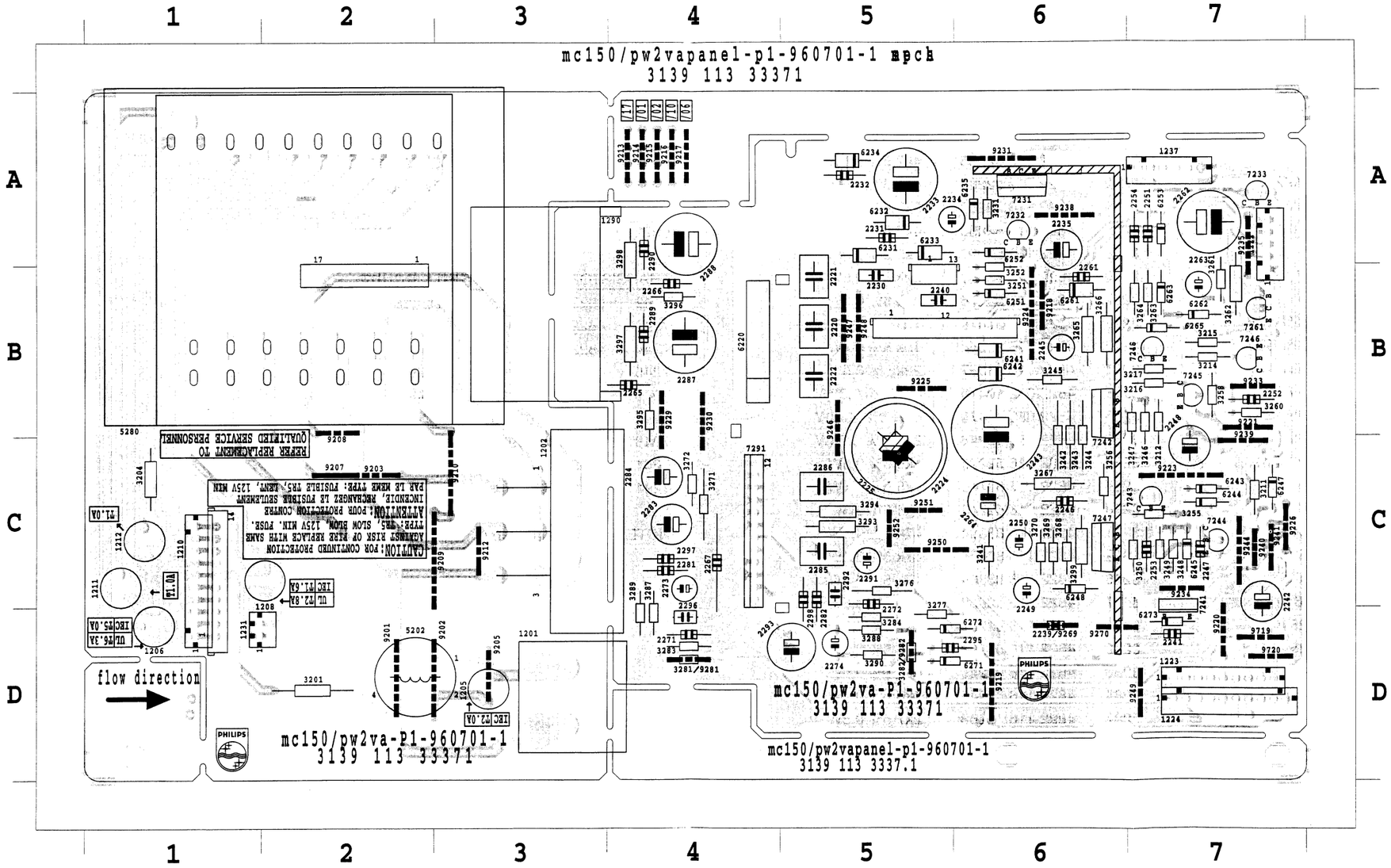
POWER 2VA COMPONENT LAYOUT

12 B 5	1223 D 7	2232 A 5	2248 C 7	2266 B 4	2287 B 4	3204 C 1	3245 B 6	3261 B 7	3276 C 5	3295 B 4	6235 A 6	6262 B 7	7244 C 7	9208 B 2	9221 B 7	9239 C 7	9270 D 6
13 B 5	1224 D 7	2233 A 5	2249 C 6	2267 C 4	2288 A 4	3211 C 7	3246 B 7	3262 B 7	3277 D 5	3296 B 4	6241 B 6	6263 B 7	7245 B 7	9209 C 2	9223 C 7	9240 C 7	9281 D 4
14 C 1	1231 D 1	2234 A 5	2250 C 6	2271 D 4	2289 B 4	3212 B 7	3247 B 7	3263 B 7	3281 D 4	3297 B 4	6242 B 6	6265 B 7	7246 B 7	9210 C 3	9224 B 6	9241 C 7	9282 D 5
1201 D 3	1237 A 7	2235 A 6	2251 A 7	2272 C 5	2290 A 4	3214 B 7	3248 C 7	3264 B 7	3282 D 5	3298 A 4	6243 C 7	6271 D 5	7247 C 6	9212 C 3	9225 B 5	9244 C 7	9719 D 7
1202 C 3	1290 B 3	2239 D 6	2252 B 7	2273 C 4	2291 C 5	3215 B 7	3249 C 7	3265 B 6	3283 D 4	3299 C 6	6244 C 7	6272 D 5	7248 B 7	9213 A 4	9226 C 7	9246 B 5	9720 D 7
1205 D 3	2220 B 5	2240 B 5	2253 C 7	2274 D 5	2292 C 5	3216 B 7	3250 C 7	3266 B 6	3284 D 5	5202 D 2	6245 C 7	6273 D 7	7261 B 7	9214 A 4	9229 B 4	9247 B 5	----
1206 D 1	2221 B 5	2241 D 7	2254 A 7	2281 C 4	2293 D 5	3217 B 7	3251 B 6	3267 C 6	3287 D 4	5280 B 2	6247 C 7	7231 A 6	7291 C 4	9215 A 4	9230 B 4	9248 B 5	
1208 C 2	2222 B 5	2242 C 7	2261 B 6	2282 C 5	2295 D 5	3231 A 6	3252 B 6	3268 C 6	3288 D 5	6220 B 4	6248 C 6	7232 A 6	9201 D 2	9216 A 4	9231 A 6	9249 D 7	
1210 C 1	2224 C 5	2243 B 6	2262 A 7	2283 C 4	2296 D 4	3241 C 6	3255 C 7	3269 C 6	3289 D 4	6231 A 5	6251 B 6	7233 A 7	9202 D 2	9217 A 4	9233 B 7	9250 C 5	
1211 C 1	2225 C 5	2245 B 6	2263 B 7	2284 C 4	2297 C 4	3242 B 6	3256 C 6	3270 C 6	3290 D 5	6232 A 5	6252 A 6	7241 C 7	9203 C 2	9218 B 6	9234 C 7	9251 C 5	
1212 C 1	2230 B 5	2246 C 6	2264 C 6	2285 C 5	2298 C 5	3243 B 6	3258 B 7	3271 C 4	3293 C 5	6233 A 5	6253 A 7	7242 B 6	9205 D 3	9219 D 6	9235 A 7	9252 C 5	
1222 A 7	2231 A 5	2247 C 7	2265 B 4	2286 C 5	3201 D 2	3244 B 6	3260 B 7	3272 C 4	3294 C 5	6234 A 5	6261 B 6	7243 C 7	9207 C 2	9220 D 7	9238 A 6	9269 D 6	


mc150/pw2vapanel-p1-960701-1 mpch
3139 113 33371
1 2 3 4 5 6 7
A
B
C
D
flow direction
mc150/pw2va-P1-960701-1
3139 113 33371
mc150/pw2va-P1-960701-1
3139 113 33371
mc150/pw2vapanel-p1-960701-1
3139 113 3337.1
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE: 6AL, SLOW BLOW, 125V MIN. FUSE.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, REMPLACER LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TRS, LENT, 125V MIN
REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
PHILIPS

ELECTRICAL PARTS LIST - POWER 2VA BOARD

MISCELLANEOUS

1201	4822 265 31016	⚠	Mains Socket
1206	4822 071 55002	⚠	Fuse T5A 250V
1211	4822 071 51002	⚠	Fuse T1A 250V
1212	4822 071 51002	⚠	Fuse T1A 250V
1290	4822 265 10967		Loudspeaker Socket

CAPACITORS

2220	5322 121 42386	100nF 5% 63V
2221	5322 121 42386	100nF 5% 63V
2222	5322 121 42386	100nF 5% 63V
2224	4822 124 11516	6800µF 20% 35V
2239	4822 122 33519	470pF 10% 50V
2240	5322 121 42386	100nF 5% 63V
2243	4822 124 42057	3300µF 20% 25V
2245	4822 124 40433	47µF 20% 25V
2246	4822 122 33197	1nF 10% 50V
2247	4822 122 33197	1nF 10% 50V
2248	4822 124 81029	100µF 20% 25V
2249	4822 124 40433	47µF 20% 25V
2250	4822 124 41584	100µF 20% 10V
2251	4822 126 12785	47nF 50V
2252	4822 122 33197	1nF 10% 50V
2253	4822 122 33197	1nF 10% 50V
2254	4822 126 12882	100nF +80-20% 50V
2261	4822 126 12882	100nF +80-20% 50V
2262	4822 124 40255	100µF 20% 63V
2263	4822 124 41596	22µF 20% 50V
2265	4822 121 51387	10nF 20% 16V
2266	4822 121 51387	10nF 20% 16V
2267	4822 122 33197	1nF 10% 50V
2271	4822 121 51387	10nF 20% 16V
2272	4822 121 51387	10nF 20% 16V
2273	4822 124 40433	47µF 20% 25V
2274	4822 124 40433	47µF 20% 25V
2281	4822 122 10577	3,3nF 10% 16V
2282	4822 122 10577	3,3nF 10% 16V
2283	4822 124 22263	220µF 20% 25V
2284	4822 124 22263	220µF 20% 25V
2285	5322 121 42386	100nF 5% 63V
2286	5322 121 42386	100nF 5% 63V
2287	4822 123 14025	16V 2200µF 20%
2288	4822 123 14025	16V 2200µF 20%
2289	4822 126 12785	47nF 50V
2290	4822 126 12785	47nF 50V
2291	4822 124 40242	1µF 20% 63V
2293	4822 123 14026	470µF 20% 35V
2295	4822 122 33519	470pF 10% 50V

RESISTORS

3204	4822 052 10108	⚠	1R 5% 0,33W
3211	4822 050 11002		1k 1% 0,4W
3212	4822 050 11002		1k 1% 0,4W
3214	4822 116 52256		2k2 5% 0,5W
3215	4822 116 52256		2k2 5% 0,5W
3216	4822 116 52256		2k2 5% 0,5W
3217	4822 116 52256		2k2 5% 0,5W
3242	4822 050 11002		1k 1% 0,4W
3243	4822 050 11002		1k 1% 0,4W
3244	4822 050 11002		1k 1% 0,4W
3245	4822 116 52283		4k7 5% 0,5W
3246	4822 116 52283		4k7 5% 0,5W
3247	4822 116 52283		4k7 5% 0,5W
3248	4822 116 52228		680R 5% 0,5W
3249	4822 116 52264		27k 5% 0,5W
3250	4822 116 52257		22k 5% 0,5W
3251	4822 116 52283		4k7 5% 0,5W
3252	4822 116 52283		4k7 5% 0,5W
3255	4822 116 52263		2k7 5% 0,5W
3256	4822 116 52283		4k7 5% 0,5W
3258	4822 116 52207		1k2 5% 0,5W
3260	4822 116 83882		39k 5% 0,5W
3261	4822 116 52276		3k9 5% 0,5W
3262	4822 052 10479	⚠	47R 5% 0,33W
3263	4822 116 83864		10k 5% 0,5W
3264	4822 116 52257		22k 5% 0,5W
3265	4822 052 10479	⚠	47R 5% 0,33W
3266	4822 052 10479	⚠	47R 5% 0,33W
3267	4822 052 10278	⚠	2R7 5% 0,33W
3268	4822 116 52243		1k5 5% 0,5W
3269	4822 116 52243		1k5 5% 0,5W
3270	4822 116 52243		1k5 5% 0,5W
3271	4822 116 83884		47k 5% 0,5W
3272	4822 116 83884		47k 5% 0,5W
3276	4822 116 83884		47k 5% 0,5W
3277	4822 116 52283		4k7 5% 0,5W
3281	4822 116 52263		2k7 5% 0,5W
3282	4822 116 52263		2k7 5% 0,5W
3283	4822 116 52249		1k8 5% 0,5W
3284	4822 116 52249		1k8 5% 0,5W
3287	4822 116 52263		2k7 5% 0,5W
3288	4822 116 52263		2k7 5% 0,5W
3289	4822 116 52222		390R 5% 0,5W
3290	4822 116 52222		390R 5% 0,5W
3293	4822 052 10228	⚠	2R2 5% 0,33W
3294	4822 052 10228	⚠	2R2 5% 0,33W
3295	4822 116 52256		2k2 5% 0,5W
3296	4822 116 52256		2k2 5% 0,5W
3297	4822 117 12148	⚠	1R5 5% 0,33W
3298	4822 117 12148	⚠	1R5 5% 0,33W
3299	4822 052 10479	⚠	47R 5% 0,33W

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ELECTRICAL PARTS LIST - POWER 2VA BOARD

COILS & FILTERS

5202	4822 157 71285	⚠	Choke Coil 400µH 30%

DIODES

6220	4822 130 82079	D3SBA20
6241	5322 130 80686	1N5392
6242	5322 130 80686	1N5392
6243	4822 130 30621	1N4148
6244	4822 130 34173	BZX79-C5V6
6245	4822 130 30621	1N4148
6247	4822 130 30621	1N4148
6248	4822 130 34167	BZX79-B6V2
6251	4822 130 30621	1N4148
6252	4822 130 30621	1N4148
6253	4822 130 34382	BZX79-C8V2
6261	5322 130 30684	1N4002GP
6262	4822 130 31024	BZX79-C18
6263	4822 130 34281	BZX79-C15
6265	4822 130 34174	BZX79-C4V7
6271	4822 130 30621	1N4148
6272	4822 130 34174	BZX79-C4V7

TRANSISTORS & INTEGRATED CIRCUITS

7242	4822 130 63575	BD242BFI
7243	4822 130 40937	BC548B
7244	4822 130 44197	BC558B
7245	4822 130 44197	BC558B
7246	4822 130 40937	BC548B
7247	4822 130 63615	BD241BFI
7248	4822 130 40937	BC548B
7261	4822 130 41646	BF423
7291	4822 209 90411	AN7164

NOTE: Only the parts mentioned in this list are normal service spare parts.

AF3 BOARD

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Circuit Diagram 12-2
Component layout 12-3
Chip component layout 12-4
Electrical parts list 12-5

12-1

BRIEF INTRODUCTION OF AF3 BOARD

The AF3 Board consists of the following:

a. SOFAC IC which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC, and IS are controllable via I^2C data from the microprocessor.
The SOFAC IC caters for 4 input sources namely Tuner, Tape, CD and AUX.

b. Karaoke Mic Mixing
NK: Non-Karaoke
SK: Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
FK: Full Karaoke with vocal fader and echo effect with additional Karaoke Board.

c. Dolby Pro-Logic interface
It caters for DPL and also DPL with one of the Karaoke functions.

d. Line out provision

e. Sub-woofer output with cinch socket for connection to active sub-woofer speaker.

f. Incredible Surround effect using transistor circuit to create phase shifting and spatial effect.

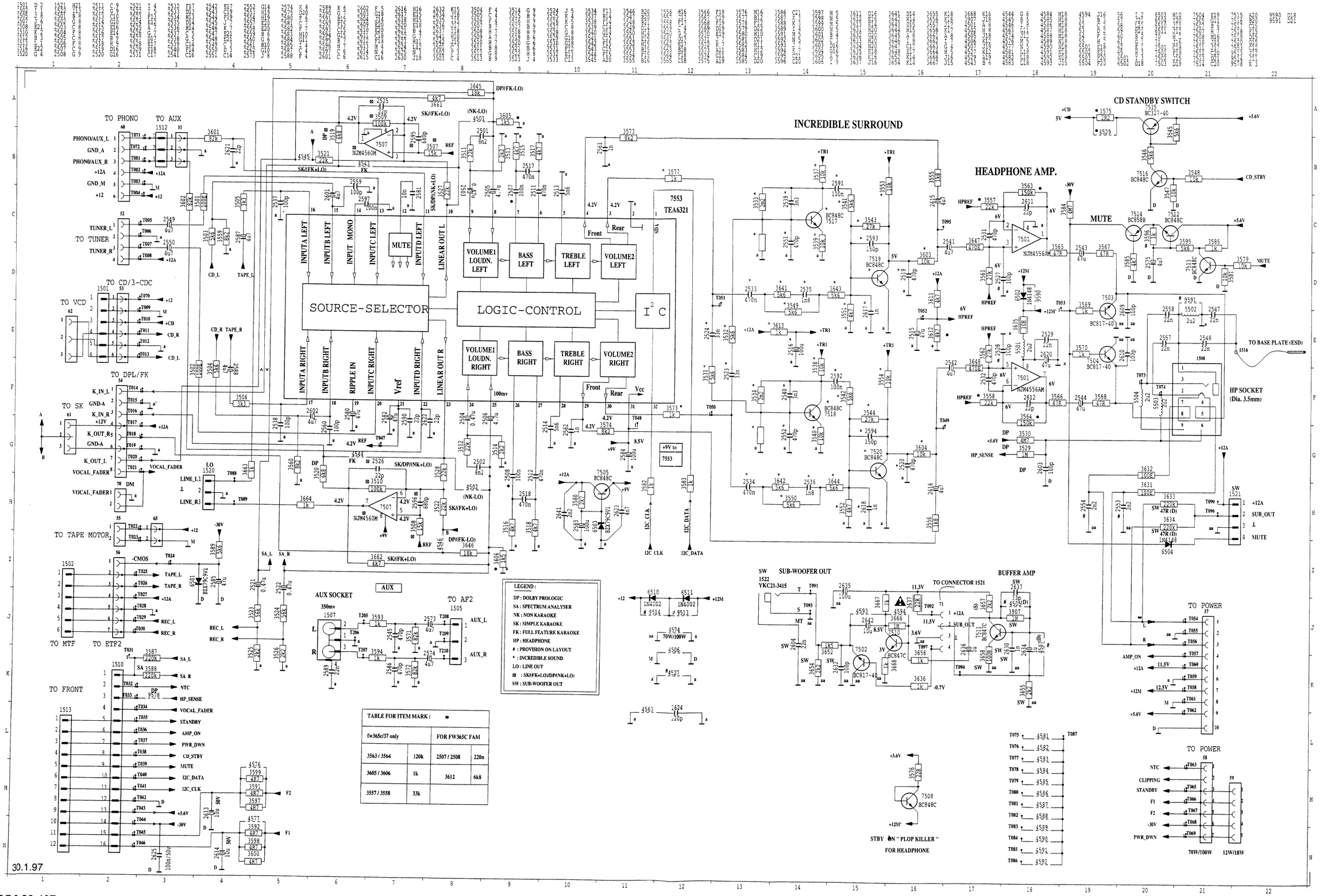
g. Headphone amplifier using Op-Amp. NJM4456M

h. CD Standby control circuit which switches on the supply to CD Servo control IC, HF circuit and the laser light pen in CD mode only.

i. Headphone Sensing circuit to mute centre and surround channels in DPL application.

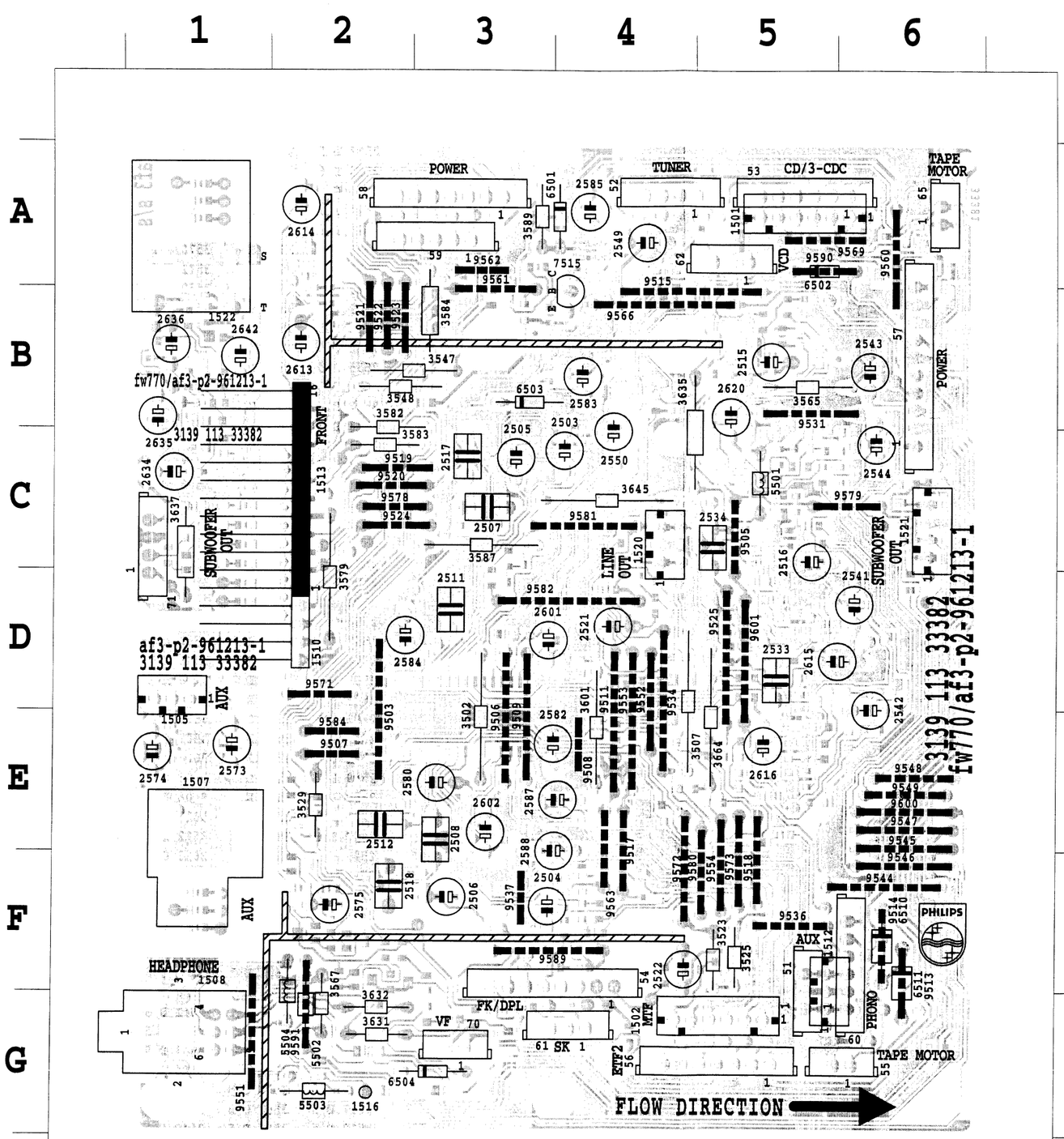
j. Attenuation network is provided at the output of the AF3 Board for interfacing with power board of different output power.

12-2


INCREDIBLE SURROUND
HEADPHONE AMP.
CD STANDBY SWITCH
TO PHONO
TO AUX
TO TUNER
TO CD/3-CDC
TO VCD
TO DPL/FK
TO SK
TO TAPE MOTOR
TO MTF
TO ETF2
TO FRONT
SOURCE-SELECTOR
LOGIC-CONTROL
I2C
7553
TEA6321
MUTE
AUX SOCKET
AUX
TO AP2
SW SUB-WOOFER OUT
BUFFER AMP
TO CONNECTOR 1521
TO BASE PLATE (ESD)
HP SOCKET
(Dia. 3.5mm)
TO POWER
STBY "PLOP KILLER"
FOR HEADPHONE
LEGEND :
DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
: PROVISION ON LAYOUT
* : INCREDIBLE SOUND
LO : LINE OUT
: SK(#FK+LO/DP(#NK+LO)
SW : SUB-WOOFER OUT
TABLE FOR ITEM MARK (
fw365c/37 only
FOR FW365C FAM
3563 / 3564 120k 2507 / 2508 220n
3605 / 3606 1k 3612 6k8
3557 / 3558 33k
30.1.97

12-3

COMPONENT LAYOUT

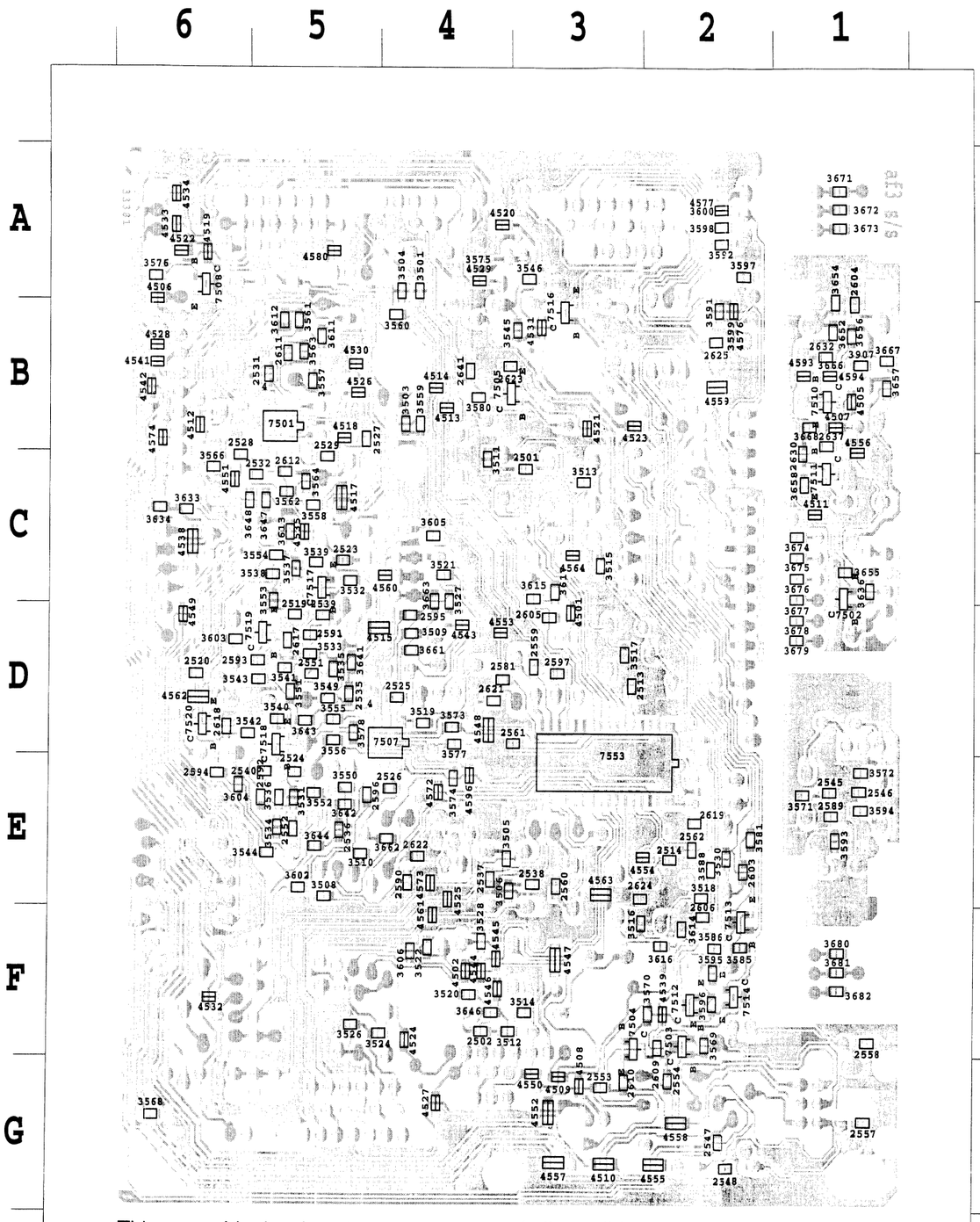


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

51 F 5	2588 F 4	9520 C 2
52 A 4	2601 D 3	9521 B 2
53 A 5	2602 E 3	9522 B 2
54 F 4	2613 B 2	9523 B 2
55 G 6	2614 A 2	9524 C 2
56 G 5	2615 D 6	9525 D 5
57 B 6	2616 E 5	9531 B 5
58 A 3	2620 B 5	9534 D 4
59 A 3	2634 C 1	9536 F 5
60 F 6	2635 B 1	9537 F 3
61 G 4	2636 B 1	9544 F 6
62 A 5	2642 B 1	9545 E 6
65 A 6	3502 E 3	9546 F 6
70 G 3	3507 D 4	9547 E 6
71 C 1	3523 F 5	9548 E 6
1501 A 5	3525 F 5	9549 E 6
1502 G 5	3529 E 2	9551 G 1
1505 D 1	3547 B 2	9552 D 4
1507 E 1	3548 B 2	9553 E 4
1508 G 1	3565 B 5	9554 F 5
1510 C 2	3567 G 2	9560 A 6
1512 F 5	3579 D 2	9561 B 3
1513 C 2	3582 C 2	9562 A 3
1516 G 2	3583 C 2	9563 E 4
1520 C 4	3584 B 3	9566 B 4
1521 C 6	3587 C 3	9569 A 5
1522 A 1	3589 A 3	9571 D 2
2503 C 4	3601 E 4	9572 F 4
2504 F 3	3631 G 2	9573 F 5
2505 C 3	3632 G 2	9578 C 2
2506 F 3	3635 C 4	9579 C 6
2507 C 3	3637 C 1	9580 F 5
2508 E 3	3645 C 4	9581 C 4
2511 D 3	3664 E 5	9582 D 4
2512 E 2	5501 C 5	9584 E 2
2515 B 5	5502 G 2	9589 F 3
2516 C 5	5503 G 2	9590 A 5
2517 C 3	5504 G 2	9591 G 2
2518 F 2	6501 A 4	9600 E 6
2521 D 4	6502 A 5	9601 D 5
2522 F 4	6503 B 3	
2533 D 5	6504 G 3	
2534 C 5	6510 F 6	
2541 D 6	6511 F 6	
2542 D 6	7515 B 4	
2543 B 6	9503 E 2	
2544 C 6	9505 C 5	
2549 A 4	9506 E 3	
2550 C 4	9507 E 2	
2573 E 1	9508 E 4	
2574 E 1	9509 E 3	
2575 F 2	9511 E 4	
2580 E 3	9513 F 6	
2582 E 3	9514 F 6	
2583 B 4	9515 B 4	
2584 D 2	9517 F 4	
2585 A 4	9518 F 5	
2587 E 4	9519 C 2	

12-4

CHIP LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2501 C 3	2623 B 4	3559 B 4	3656 B 1
2502 F 4	2624 E 3	3560 B 4	3657 B 1
2513 D 3	2625 B 2	3561 B 5	3658 C 1
2514 E 2	2630 C 1	3562 C 5	3661 D 4
2519 D 5	2632 B 1	3563 B 5	3662 E 4
2520 D 6	2637 B 1	3564 C 5	3663 C 4
2523 C 5	2641 B 4	3566 C 6	3666 B 1
2524 E 5	3501 A 4	3568 G 6	3667 B 1
2525 D 4	3503 B 4	3569 F 2	3668 B 1
2526 E 4	3504 A 4	3570 F 2	3671 A 1
2527 B 5	3505 E 4	3571 E 1	3672 A 1
2528 C 6	3506 E 4	3572 E 1	3673 A 1
2529 C 5	3508 E 5	3573 D 4	3674 C 1
2531 B 5	3509 D 4	3574 E 4	3675 C 1
2532 C 5	3510 E 5	3575 A 4	3676 C 1
2535 D 5	3511 C 4	3576 A 6	3677 C 1
2536 E 5	3512 F 4	3577 D 4	3678 D 1
2537 E 4	3513 C 3	3578 D 5	3679 D 1
2538 E 3	3514 F 3	3580 B 4	3680 F 1
2539 D 5	3515 C 3	3581 E 2	3681 F 1
2540 E 5	3516 F 3	3585 F 2	3682 F 1
2545 E 1	3517 D 3	3586 F 2	3907 B 1
2546 E 1	3518 E 2	3588 E 2	4501 D 3
2547 G 2	3519 D 4	3591 B 2	4502 F 4
2548 G 2	3520 F 4	3592 A 2	4505 B 1
2551 D 5	3521 C 4	3593 E 1	4506 B 6
2552 E 5	3522 F 4	3594 E 1	4507 B 1
2553 G 3	3524 F 4	3595 F 2	4508 G 3
2554 G 2	3526 F 5	3596 F 2	4509 G 3
2557 G 1	3527 C 4	3597 A 2	4510 G 3
2558 F 1	3528 F 4	3598 A 2	4511 C 1
2559 D 3	3530 E 2	3599 B 2	4512 B 6
2560 E 3	3531 E 5	3600 A 2	4513 B 4
2561 D 3	3532 C 5	3602 E 5	4514 B 4
2562 E 2	3533 D 5	3603 D 6	4515 D 5
2581 D 4	3534 E 5	3604 E 6	4517 C 5
2589 E 1	3535 D 5	3605 C 4	4518 B 5
2590 E 4	3536 E 5	3606 F 4	4519 A 6
2591 D 5	3537 C 5	3611 B 5	4520 A 4
2592 E 5	3538 C 5	3612 B 5	4521 B 3
2593 D 5	3539 C 5	3613 C 5	4522 A 6
2594 E 6	3540 D 5	3614 F 2	4523 B 3
2595 D 4	3541 D 5	3615 C 3	4524 F 4
2596 E 5	3542 D 6	3616 F 2	4525 E 4
2597 D 3	3543 D 5	3617 C 3	4526 B 5
2603 E 2	3544 E 5	3633 C 6	4527 G 4
2604 B 1	3545 B 3	3634 C 6	4528 B 6
2605 D 3	3546 A 3	3636 C 1	4529 A 4
2606 F 2	3549 D 5	3641 D 5	4530 B 5
2609 F 2	3550 E 5	3642 E 5	4531 B 3
2610 G 3	3551 D 5	3643 D 5	4532 F 6
2611 B 5	3552 E 5	3644 E 5	4533 A 6
2612 C 5	3553 C 5	3646 F 4	4534 A 6
2617 D 5	3554 C 5	3647 C 5	4535 C 5
2618 D 6	3555 D 5	3648 C 6	4538 C 6
2619 E 2	3556 D 5	3652 B 1	4539 F 2
2621 D 4	3557 B 5	3654 B 1	4541 B 6
2622 E 4	3558 C 5	3655 C 1	4542 B 6

ELECTRICAL PARTS LIST - AF3 BOARD

MISCELLANEOUS

1507	4822 265 20553	AUX socket
1508	4822 267 40898	Headphone
1522	4822 267 31729	Subwoofer socket

CAPACITORS

2501	4822 122 33336	8,2nF 10% 50V
2502	4822 122 33336	8,2nF 10% 50V
2503	4822 124 41407	0.47µF 50V
2504	4822 124 41407	0.47µF 50V
2505	4822 124 40746	0.22µF 50V
2506	4822 124 40746	0.22µF 50V
2507	5322 121 42386	100NF 5% 63V
2508	5322 121 42386	100NF 5% 63V
2511	4822 121 51252	470nF 50V
2512	4822 121 51252	470nF 50V
2513	4822 122 32646	5,6nF 10% 50V
2514	4822 122 32646	5,6nF 10% 50V
2515	4822 124 40433	47µF 25V
2516	4822 124 81029	100µF 25V
2517	4822 121 51252	470nF 50V
2518	4822 121 51252	470nF 50V
2519	5322 122 32268	470pF 10% 50V
2520	5322 122 32268	470pF 10% 50V
2521	4822 124 41407	0.47µF 50V
2522	4822 124 41407	0.47µF 50V
2523	4822 122 33342	33nF 5% 50V
2524	4822 122 33342	33nF 5% 50V
2525	5322 122 32452	22pF 5% 50V
2526	5322 122 32452	22pF 5% 50V
2527	5322 122 32531	100pF 5% 50V
2528	5322 122 32531	100pF 5% 50V
2529	5322 122 32654	22nF 10% 63V
2531	5322 122 32268	470pF 10% 50V
2532	5322 122 32268	470pF 10% 50V
2533	4822 121 51252	470nF 50V
2534	4822 121 51252	470nF 50V
2535	4822 122 33219	1.8nF 5% 50V
2536	4822 122 33219	1.8nF 5% 50V
2537	5322 122 32531	100pF 5% 50V
2538	5322 122 32531	100pF 5% 50V
2539	4822 122 33891	3.3nF 5% 50V
2540	4822 122 33891	3.3nF 5% 50V
2541	4822 124 40246	4.7µF 50V
2542	4822 124 40246	4.7µF 50V
2543	4822 124 41751	47µF 50V
2544	4822 124 41751	47µF 50V
2545	5322 122 32268	470pF 10% 50V
2546	5322 122 32268	470pF 10% 50V
2547	4822 122 32654	22nF Y5V 50V
2548	4822 122 32654	22nF Y5V 50V
2549	4822 124 40246	4.7µF 50V
2550	4822 124 40246	4.7µF 50V
2551	5322 122 32268	470pF 10% 50V
2552	5322 122 32268	470pF 10% 50V
2557	5322 122 32654	22nF 10% 63V
2558	5322 122 32654	22nF 10% 63V
2559	5322 122 32531	100pF NP0 50V
2560	5322 122 32531	100pF NP0 50V
2561	5322 122 34123	1nF 10% 50V
2562	5322 122 34123	1nF 10% 50V
2573	4822 124 40246	4.7µF 50V
2574	4822 124 40246	4.7µF 50V
2575	4822 124 40246	4.7µF 50V
2580	4822 124 41751	4.7µF 50V
2581	4822 122 33177	10nF 10% 50V
2582	4822 124 41751	4.7µF 50V
2583	4822 124 81029	100µF 25V
2584	4822 124 81029	100µF 25V
2587	4822 124 40246	4.7µF 50V
2588	4822 124 40246	4.7µF 50V
2589	4822 126 13838	100nF +80/-20% 50V
2590	5322 122 32658	22pF 5% 50V
2591	4822 126 13838	100nF +80/-20% 50V
2592	4822 126 13838	100nF +80/-20% 50V
2593	4822 122 33575	220pF 5% 50V
2594	4822 122 33575	220pF 5% 50V
2595	4822 122 32535	680pF 5% 50V
2596	4822 122 32535	680pF 5% 50V
2597	4822 126 13838	100nF +80/-20% 50V
2601	4822 124 40246	4.7µF 50V
2602	4822 124 40246	4.7µF 50V
2604	4822 126 13838	100nF +80/-20% 50V
2609	5322 122 32531	100pF 5% 50V
2610	5322 122 32531	100pF 5% 50V
2611	5322 122 32452	47pF 5% NP0 63V
2611	5322 122 32658	22pF 5% 50V -/21
2612	5322 122 32658	22pF 5% 50V -/21
2612	5322 122 32452	47pF 5% NP0 63V
2615	4822 124 40246	4.7µF 50V
2616	4822 124 40246	4.7µF 50V
2617	5322 122 34123	1nF 10% 50V
2618	5322 122 34123	1nF 10% 50V
2620	4822 124 40433	47µF 25V
2621	5322 122 32658	22pF 5% 50V
2622	5322 122 32658	22pF 5% 50V
2623	5322 126 10223	4.7nF 10% 63V
2624	5322 126 10223	4.7nF 10% 63V
2625	4822 126 13838	100nF 20% 50V
2630	5322 122 34123	1nF 10% 50V
2632	5322 122 32531	100pF 5% 50V
2634	4822 124 40242	1µF 50V
2636	4822 124 40242	1µF 50V
2641	4822 122 33175	2,2nF 20% 50V

ELECTRICAL PARTS LIST - AF3 BOARD

RESISTORS

3501	4822 051 20109	10R 5% 0,1W
3502	4822 116 52176	10R 5% 0,5W
3503	4822 051 20562	5K6 5% 0,1W
3504	4822 051 20562	5K6 5% 0,1W
3505	4822 051 20332	3K3 5% 0,1W
3506	4822 051 20332	3K3 5% 0,1W
3507	4822 116 52244	15K 5% 0,1W
3508	4822 116 52244	15K 5% 0,1W
3509	4822 051 20104	100k 5% 0,1W
3510	4822 051 20104	100k 5% 0,1W
3511	4822 051 20223	22K 5% 0,1W
3512	4822 051 20223	22K 5% 0,1W
3513	4822 117 11449	2K2 5% 0,1W
3514	4822 117 11449	2K2 5% 0,1W
3515	4822 051 20472	4K7 5% 0,1W
3516	4822 051 20472	4K7 5% 0,1W
3517	4822 051 20472	4K7 5% 0,1W
3518	4822 051 20472	4K7 5% 0,1W
3522	4822 051 20223	22K 5% 0,1W -/21
3523	4822 116 83884	47K 5% 0,5W
3524	4822 051 20473	47K 5% 0,1W
3525	4822 116 83882	39K 5% 0,5W
3526	4822 051 20393	39K 5% 0,1W
3527	4822 051 20223	22K 5% 0,1W -/21
3528	4822 051 20223	22K 5% 0,1W -/21
3531	4822 051 20562	5k6 5% 0,1W
3532	4822 051 20562	5k6 5% 0,1W
3533	4822 051 20225	2M2 5% 0,1W
3534	4822 051 20225	2M2 5% 0,1W
3537	4822 117 10833	10k 5% 0,1W
3538	4822 117 10833	10k 5% 0,1W
3539	4822 117 10833	10k 5% 0,1W
3540	4822 117 10833	10k 5% 0,1W
3541	4822 051 20562	5k6 5% 0,1W
3542	4822 051 20562	5k6 5% 0,1W
3543	4822 051 20273	27k 5% 0,1W
3544	4822 051 20273	27k 5% 0,1W
3545	4822 051 20562	5K6 5% 0,1W
3546	4822 051 20562	5K6 5% 0,1W
3547	4822 116 83864	10K 5% 0,5W
3548	4822 116 52256	2K2 5% 0,5W
3549	4822 051 20562	5K6 5% 0,1W
3550	4822 051 20562	5K6 5% 0,1W
3551	4822 051 20472	4K7 5% 0,1W
3552	4822 051 20472	4K7 5% 0,1W
3553	4822 117 10833	10K 1% 0,1W
3554	4822 117 10833	10K 1% 0,1W
3555	4822 051 20182	1K8 5% 0,1W
3556	4822 051 20182	1K8 5% 0,1W
3557	4822 051 20223	22K 5% 0,1W
3558	4822 051 20223	22K 5% 0,1W
3559	4822 051 20822	8K2 5% 0,1W
3560	4822 051 20822	8K2 5% 0,1W
3561	4822 051 20273	27K 5% 0,1W -/21
3561	4822 116 52195	47R 5% 0,5W
3562	4822 051 20273	27K 5% 0,1W
3563	4822 051 20154	150K 5% 0,1W
3564	4822 051 20154	150K 5% 0,1W
3565	4822 116 52195	47R 5% 0,5W
3566	4822 051 20479	47R 5% 0,1W
3567	4822 116 52195	47R 5% 0,5W
3568	4822 051 20479	47R 5% 0,1W
3569	4822 051 10102	1K 5% 0,1W
3570	4822 051 10102	1K 5% 0,1W
3571	4822 117 11149	82K 5% 0,1W
3572	4822 117 11149	82K 5% 0,1W
3573	4822 051 20822	8K2 5% 0,1W
3574	4822 051 20822	8K2 5% 0,1W
3575	4822 051 20228	2R2 5% 0,1W
3577	4822 051 10102	1K 5% 0,1W
3578	4822 051 10102	1K 5% 0,1W
3579	4822 116 52256	2K2 5% 0,5W
3580	4822 117 11139	1K5 5% 0,1W
3581	4822 117 10833	10K 5% 0,1W
3582	4822 050 11002	1K 5% 0,5W
3583	4822 050 11002	1K 5% 0,5W
3584	4822 050 24705	4M7 1% 0,6W
3585	4822 051 20472	4K7 5% 0,1W
3586	4822 051 10102	1K 5% 0,1W
3593	4822 051 10102	1K 5% 0,1W
3594	4822 051 10102	1K 5% 0,1W
3595	4822 051 20562	5K6 5% 0,1W
3601	4822 116 52304	82K 5% 0,5W
3602	4822 117 11149	82K 5% 0,1W
3603	4822 117 10833	10K 5% 0,1W
3604	4822 117 10833	10K 5% 0,1W
3605	4822 051 10102	1k 5% 0,1W
3606	4822 051 10102	1k 5% 0,1W
3611	4822 051 20472	4K7 5% 0,1W
3612	4822 051 20472	4K7 5% 0,1W
3613	4822 051 10102	1K 2% 0,25W
3631	4822 051 20101	100R 5% 0,5W
3632	4822 051 20101	100R 5% 0,5W
3633	4822 051 20224	220K 5% 0,1W
3634	4822 051 20224	220K 5% 0,1W
3635	4822 052 10109	25R 5% 0,33W
3636	4822 051 10102	1K 5% 0,1W
3641	4822 051 20562	5k6 5% 0,1W
3642	4822 051 20562	5k6 5% 0,1W
3643	4822 051 20562	5K6 5% 0,1W
3644	4822 051 20562	5K6 5% 0,1W
3645	4822 116 52271	33K 5% 0,5W
3646	4822 116 52271	33K 5% 0,5W
3647	4822 051 20101	100R 5% 0,1W
3648	4822 051 20101	100R 5% 0,1W
3661	4822 051 20472	4K7 5% 0,1W
3662	4822 051 20472	4K7 5% 0,1W
3907	4822 051 20334	330K 5% 0,1W

ELECTRICAL PARTS LIST - AF3 BOARD

JUMPER

4501	4822 051 20008	JUMPER -/22/25/34
4502	4822 051 20008	JUMPER -/22/25/34
4506	4822 051 20008	CHIP JUMPER
4508	4822 051 20008	CHIP JUMPER
4509	4822 051 20008	CHIP JUMPER
4510	4822 051 10008	CHIP JUMPER
4511	4822 051 20008	CHIP JUMPER
4512	4822 051 20008	CHIP JUMPER
4513	4822 051 20008	CHIP JUMPER
4514	4822 051 20008	CHIP JUMPER
4515	4822 051 10008	CHIP JUMPER
4517	4822 051 10008	CHIP JUMPER
4518	4822 051 20008	CHIP JUMPER
4519	4822 051 20008	CHIP JUMPER
4520	4822 051 20008	CHIP JUMPER
4521	4822 051 20008	CHIP JUMPER
4522	4822 051 20008	CHIP JUMPER
4523	4822 051 20008	CHIP JUMPER
4524	4822 051 20008	CHIP JUMPER
4525	4822 051 20008	CHIP JUMPER
4526	4822 051 20008	CHIP JUMPER
4528	4822 051 20008	CHIP JUMPER
4530	4822 051 20008	CHIP JUMPER
4531	4822 051 20008	CHIP JUMPER
4532	4822 051 20008	CHIP JUMPER
4533	4822 051 20008	CHIP JUMPER
4534	4822 051 20008	CHIP JUMPER
4535	4822 051 20008	CHIP JUMPER
4538	4822 051 10008	CHIP JUMPER
4539	4822 051 20008	CHIP JUMPER
4541	4822 051 20008	CHIP JUMPER
4542	4822 051 20008	CHIP JUMPER
4547	4822 051 10008	CHIP JUMPER
4548	4822 051 10008	CHIP JUMPER
4549	4822 051 20008	CHIP JUMPER
4550	4822 051 20008	CHIP JUMPER
4552	4822 051 10008	CHIP JUMPER
4553	4822 051 20008	CHIP JUMPER
4555	4822 051 10008	CHIP JUMPER
4556	4822 051 20008	CHIP JUMPER
4557	4822 051 10008	CHIP JUMPER
4558	4822 051 10008	CHIP JUMPER
4561	4822 051 20008	JUMPER -/21
4562	4822 051 20008	CHIP JUMPER
4563	4822 051 10008	CHIP JUMPER
4572	4822 051 20008	CHIP JUMPER
4573	4822 051 20008	CHIP JUMPER
4576	4822 051 20008	CHIP JUMPER
4577	4822 051 20008	CHIP JUMPER
4580	4822 051 20008	CHIP JUMPER
4585	4822 051 20008	JUMPER
4596	4822 051 20008	CHIP JUMPER

INDUCTORS

5501	4822 156 21721	INDUCTOR 2,2µH 10%
5502	4822 156 21721	INDUCTOR 2,2µH 10%
5503	4822 156 21721	INDUCTOR 2,2µH 10%
5504	4822 156 21721	INDUCTOR 2,2µH 10%

DIODES

6503	4822 130 30862	BZX79-C9V1
6504	4822 130 30621	1N4148

TRANSISTORS

7503	4822 130 42615	BC817-40
7504	4822 130 42615	BC817-40
7505	5322 130 42755	BC847C
7507	4822 209 83357	NJM 4560M -/21
7512	5322 130 42755	BC847C
7513	5322 130 42755	BC847C
7514	5322 130 60508	BC857B
7515	4822 130 41327	BC327-40
7516	5322 130 42755	BC847C
7517	5322 130 42755	BC847C
7518	5322 130 42755	BC847C
7519	5322 130 42755	BC847C
7520	5322 130 42755	BC847C

INTERGRATED CIRCUITS

7501	4822 209 31378	NJM4556AM
7553	4822 209 33652	TEA6321T

Note : Only the parts mentioned in this lists are noraml service spare parts.

ELECTRICAL PARTS LIST - AF3 BOARD

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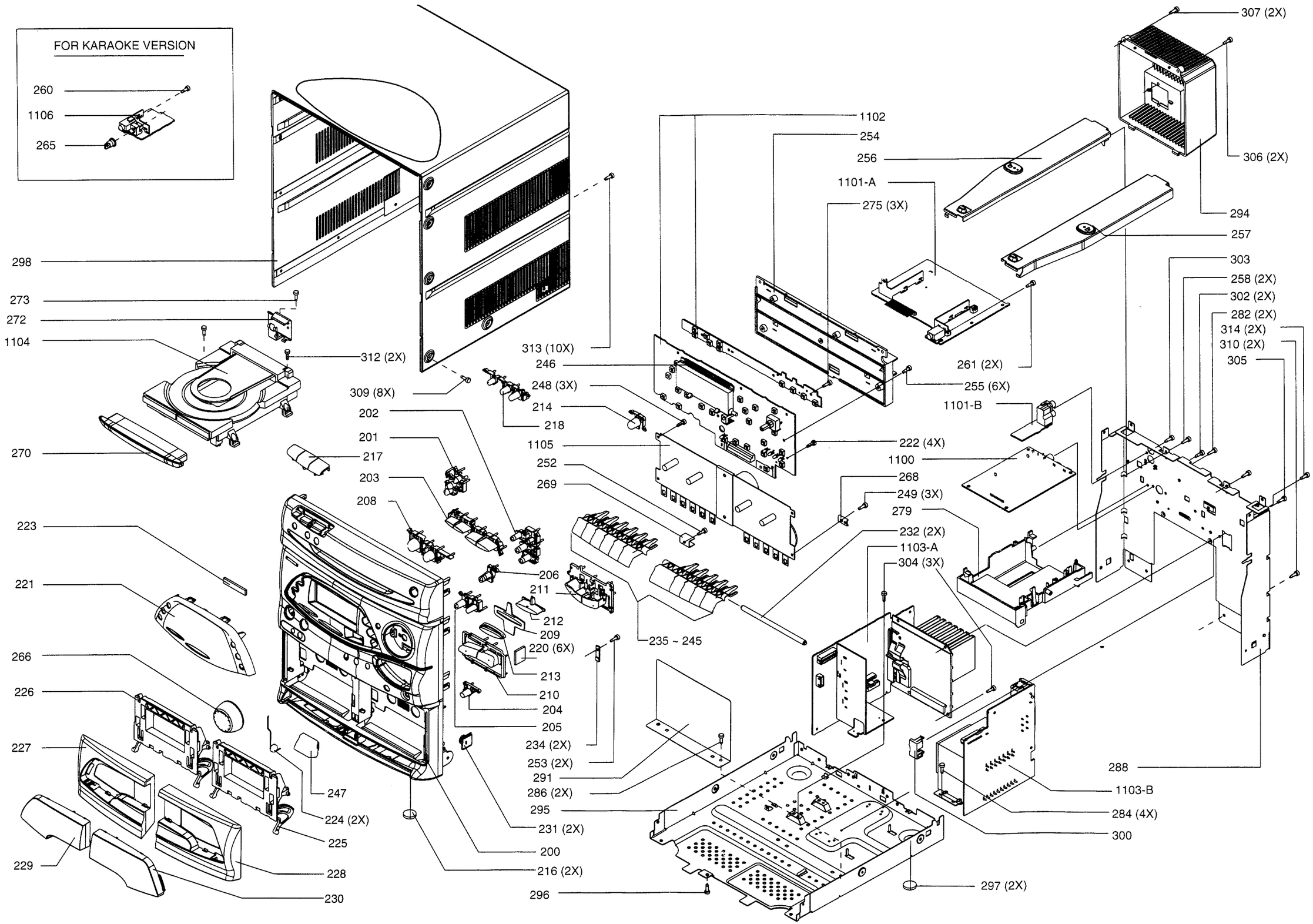
SET EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTSLIST - MAIN UNIT

200	4822 459 04509	CABINET FRONT /22/25/34
200	4822 459 04506	CABINET FRONT /21
201	4822 410 10195	BUTTON LEFT (N/RDS) /21
201	4822 410 10522	BUTTON LEFT /22/25/34
202	4822 410 10196	BUTTON DISPLAY RIGHT
203	4822 410 10918	BUTTON SET TUNER
204	4822 410 10198	BUTON HSD
205	4822 410 10199	BUTTON OPT/DBB
206	4822 410 10418	KNOB INCRED. SOUND /21
208	4822 410 10201	BUTTON POWER/SOURCE
210	4822 410 11006	BUTTON DSC1
211	4822 410 11007	BUTTON DSC2
212	4822 466 11124	LIGHT SUIDE DSC
213	4822 462 10758	CAP LIGHT GUIDE DSC
214	4822 410 10204	BUTTON OPEN/CLOSE
216	4822 462 40683	PLATE (FOOT)
217	4822 410 10922	BUTTON CDC1
218	4822 410 10207	BUTTON CDC2
221	4822 450 10245	WINDOW DISP(N/RDS) /21/34
221	4822 450 10294	WINDOW DISPLAY RDS /22/25
224	4822 492 11049	SPRING
225	4822 443 10173	DOOR CASSETTE RIGHT
226	4822 443 10173	DOOR CASSETTE RIGHT
227	4822 442 00815	COVER DOOR CASS L /21
228	4822 442 00784	COVER DOOR CASS R

SCREW LISTS - MAIN UNIT

222	D3 X 12	296	D3 X 10
248	D3 X 10	302	D3 X 12
249	D3 X 10	303	D3 X 12
252	D3 X 10	304	M3 X 6
253	D3 X 10	305	D3 X 12
255	D3 X 12	306	D3 X 6
258	D3 X 12	307	D3 X 12
260	D3 X 10	309	D3 X 10
261	D3 X 10	310	M3 X 6
263	D3 X 12	312	D3 X 10
273	M3 X 10	313	D3 X 10
275	D3 X 12	314	M3 X 6
282	D3 X 12		
284	M3 X 6		
286	M3 X 10		

229	4822 450 10246	LENS CASSETTE LEFT
230	4822 450 10247	LENS CASSETTE RIGHT
231	4822 529 10322	DAMPER ASSY
235	4822 410 10208	BUTTON CASS 1 REC
236	4822 410 10209	BUTTON CASS 2 PLAY
237	4822 410 10211	BUTTON CASS 3 FRW
238	4822 410 10212	BUTTON CASS 4 FFW
239	4822 410 10213	BUTTON CASS 5 STOP
240	4822 410 10214	BUTTON CASS 6 PAUSE
241	4822 410 10215	BUTTON CASS 7 PLAY
242	4822 410 10216	BUTTON CASS 8 FRW
243	4822 410 10217	BUTTON CASS 9 FFW
244	4822 410 10218	BUTTON CASS 10 STOP
245	4822 410 10219	BUTTON CASS 11 PAUSE
265	4822 410 10533	KNOB KARAOKE /21
266	4822 410 10966	KNOB VOLUME ROTARY
270	4822 442 00799	COVER TRAY 3-CDC
297	4822 462 40683	PLATE (FOOT)
298	4822 426 10187	CABINET REAR
300	4822 402 10288	BRACKET MAINS SOCKET
1110	4822 146 10443	TRANSFORMER /21
1110	4822 146 10465	TRANSFORMER /22/25/34
	4822 321 10886	MAINS CORD /25
	4822 321 10249	MAINS CORD
	4822 445 10592	1X LOUDSPEAKER BOX
	4822 219 10195	REMOTE CONTROL /21
	4822 303 50063	FM AERIAL /21
	4822 303 50082	AM FRAME AERIAL
	4822 736 15099	INSTRUCTION FOR USE /21
	4822 736 15105	INSTRUCTION FOR USE /22/25
	4822 736 15104	INSTRUCTION FOR USE /34
	4822 691 10479	TAPEDECK MECHANISM YSW27-500

Note : Only the parts mentioned in this list are normal service spare parts.

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